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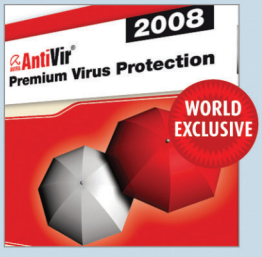

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Editorial

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Technology confuses the experts

Even computer experts such as ourselves are confused about the different standards now roaming the home media market

I must admit that, even as a hardcore technology fanatic, I'm getting very confused about TV and video these days. Not long ago, it was simple. Buy a telly, plug in an aerial, switch it on and off you go. If you wanted to watch something later, connect up a video recorder.

But I recently realised that I actually have no idea what I'm really watching when I get a rare moment to be a couch potato.

I have a cable service, which is delivered to my set-top box via a mixture of fibre and metal wires. It's arriving there as multiple encrypted MPEG2 data streams, whence it's decoded and unscrambled before being converted to the analog signal that's sent to my TV. It's not yet connected to a digital PVR, but my service includes a catch-up channel that lets me watch seven days' worth of selected content whenever I want.

'Do you know what the DLNA certified sticker on a laptop means? Me neither'

But I also watch and record TV on my PC, courtesy of Vista's Media Center and a Freeview dual tuner card. This is also an MPEG2 stream, but arrives as a digital multiplex via my normal rooftop aerial. It then goes through all sorts of transformations before I watch it. If I had an Xbox 360, I could use it as a Vista Media Center Extender to stream live or recorded programs via a wired or wireless network around the house to any convenient TV set. Courtesy of a wireless AV sender device, I can also link up an 'orphan' TV in a bedroom to watch content from either my cable box or another Freeview box.

And if I decide to burn a favourite program to a DVD for archiving, it makes my head hurt just thinking about the number of times the digital bits it contains have been massaged, manipulated, converted and repackaged. It's a minor miracle that anything comes out of the other end at all.

Add in the web, and things now start to get really complicated. Go the BBC's iPlayer, Joost, Channel 4's 4OD service or any other IPTV service, and you can watch time-shifted programs streamed or by downloading them to your PC (in the obligatory DRM-protected WMV format, of course). I could then stream that downloaded content around my house if I wished, using Windows Media Connect or various other streaming AV players, as long as they support the file formats.

But the big problem with all this is that, without doing a lot of research, I have very little idea of what hardware and software will work with this proliferation of content types and data streams. If my streaming device can't connect to or play my files on the PC, who do I blame?

Of course, that's what standards were invented for, but in the home media network market we're plagued with a proliferation of these, none of which are really understood or explained. Do you know what the DLNA Certified sticker on a laptop is supposed to mean? Me neither, at least until I read this month's feature on page 44 that attempts to clarify the current mishmash of standards. I hope it will also help you to make smarter buying decisions, although as our writer discovered there's still some way to go before everything works with everything else.

On a different tack, I'd like to apologise for the non-appearance of the electronic copy of the first edition of PCW from the cover discs in our April issue. But you will definitely find it on this month's cover disc, or you can download a copy from www.vnudownloads.com/pcw_firstissue.zip.

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Cheap mobiles spark turmoil

It has been a very heavy news month in the computing world, and not only because two major IT shows opened within a few days of each other.

Microsoft was looking punch drunk after a series of setbacks, starting with a poor response to its $40bn bid for Yahoo – and the proposal itself being seen as a sign of weakness in face of Google's web dominance.

Similar scepticism met its claim to be launching a new era of openness over its programming interfaces. No more so than from EU regulators, who fined the company a record £608m for monopoly abuse.

By accident or design this came as Microsoft prepared to launch the latest versions of its flagship enterprise products Windows Server 2008, Visual Studio 2008, and SQL Server 2008, completely overshadowing what the company billed as its biggest ever event of its kind (see page 23).

Meanwhile Microsoft began a tricky endgame in its battle to get its Open XML formats adopted as an ISO standard. The result of the balloting process should be known later this month (page 20).

There are also signs that Linux is starting to challenge Windows in the mainstream. Mobile operators are backing two groups trying to establish a standard Linux handset platform (page 18) and emerging low-cost ultra-mobiles are favouring open source.

Microsoft has put together a bundle for a new upmarket Eee PC (page 11) but hardware coming in at £100 (see below) will put pressure on software prices.

The emerging mobile formats are redrawing the processor battlelines, too. Intel released details of its upcoming low-drain range, renamed Atom (page 20), while at Germany's massive Cebit show rival AMD demonstrated 45nm technology that should enable it to compete better.

But Intel's major competition in these new mini formats could be companies using ARM architecture (page 18). The formats themselves could provide competition for smartphones, though vendors at Mobile World Congress in Barcelona seemed oblivious to the fact. The big news there was the emergence of a technology called LTE as the 4G technology of choice for cellular operators. It will compete with Wimax, or perhaps be 'harmonised' with it (page 14).

What is clear is that, if operators get their way, we shall have within two or three years roaming web access at speeds comparable to today's fixed broadband. Whether or not we will be able to afford to use it is another matter. *Clive Akass*

Eee PC trumped by £99 Elonex mini laptop

Elonex has trumped the £200 Asus Eee PC by offering a similar mini laptop for just £99.

The Elonex One is a curious design, looking at first sight like a standard laptop. But closer inspection shows that all the workings (and weight) are in the lid, which also houses the 7in 800x480-resolution screen.

The keyboard is detachable and it seems from the specification that the rear can be used for touch input. Emil Larsen, who saw a similar model branded Gecube at Cebit (see page 11), reports that it looks a good robust design.

It weighs 0.95kg, measures 22x15x3cm, and uses a Chinese-made custom x86 processor dubbed the LNX Core 8, clocking 300MHz. It has 128MB of Ram and 1GB of Flash memory. Elonex also offers USB Flash storage of between 1GB and 16GB of removable memory that straps round the wrist, presumably to stop kids losing it.

The device has two USB2 ports, audio sockets, two built-in speakers and support for Wifi and wired Ethernet, with a Bluetooth option. It runs Linos 2.6.21 Linux and comes with "education-oriented" software. Elonex is taking pre-orders at **www.elonexone.co.uk**.

But not all the new mini laptops are going downmarket. Belinia's novel S.book 1, reviewed on page 59, has a good keyboard, a touchscreen, and runs XP. Most interesting is the fact that it packs a VoIP handset, which can be used separately.

One possible design for future true portables is to make them modular, with a pull-out mobile phone to use by itself when the full machine is not required.

The Elonex One is a 950g laptop for under a ton

HD DVD bargain hunt begins

Toshiba has conceded victory to Blu-ray in the high-definition format war by announcing it is dropping its HD DVD business.

The widely anticipated move by the technology's main backer virtually kills off the format.

Ironically, it increased interest in HD DVD drives from bargain-hunters aiming to use them as high-quality DVD drives with good up-scaling – boosting standard resolution to HD.

Dominic Yacoubian, managing director of 24-7 Electrical, said they will be selling for around £115.

"This is a really great opportunity for people who want a quality DVD player. But once the stock has been sold that will be that," he said.

Microsoft announced that it was withdrawing support for the format just days after insisting that it would continue to produce HD DVD drives. Some 300,000 people have already bought its HD DVD drive for the console at a US price of just $130.

The beginning of the end for HD DVD came shortly before the Consumer Electronics Show in January when Hollywood giant Warner Brothers withdrew its support for the format. The last straw came when US supermarket chain Wal-Mart said that it too was dropping the product.

Toshiba president Atsutoshi Nishida said in a press statement: "We carefully assessed the long-term impact of continuing the 'next-generation format war' and concluded that a swift decision will best help the market develop."

The decision is good news for anyone who has not bought HD DVD products, said Gartner principal research analyst Paul O'Donovan.

"Now everyone can focus on creating content and equipment for the pent-up demand for high-definition video. Consumers can now look to building their library of HD content in one format that will be around for many years."

Synaptics adds two-finger gesture to PCs

Gesture control similar to that in Apple's iPhone will be coming to PCs and notebooks during the next few months, according to touchpad designer Synaptics.

It announced with unintentional humour that it is introducing "two-finger gestures" to touchpads and touchscreens.

The gestures will include the pinching of the thumb and finger as featured on the latest Apple devices to open and close pages or images.

Also in the pipeline is what is called chiral motion, a circular movement of the finger that controls the speed as well as the direction of scrolling.

This, judging from a demonstration at Mobile World Congress by technical marketing manager John Feland, makes it easier to scroll through emails.

Flicking your finger will give screen movements inertia, so that changes slow to a halt, producing an effect similar to that which makes using the iPhone and iPod Touch seem so natural.

Feland said Apple has applied for patents on some of its effects but has not been granted them. "These things have been done for years in laboratories," he said.

→ **www.pcw.co.uk/2209491**

Nokia avoids 'gimmicky' touch

Nokia will launch an Apple-style touchscreen interface on its mobile devices – but not yet, executives said at Mobile World Congress in Barcelona.

Niklas Savander, executive vice-president of software and services, said the company had to maintain "some semblance of a migration path" from existing designs.

He promised: "We will bring out such products. But we don't want to bring out something that is simply gimmicky."

Chief executive Olli-Pekka Kallasvuo said that when Nokia is ready to release a touchscreen interface it will have a variety of different phone sizes. Four new Nokias were launched, including the N96 (right), a successor to the N95, with more memory and a bigger screen.

Executives said that despite the success of Apple´s iPhone, Nokia won a highest-ever 40 per cent market share last year.

→ **See pages 14 and 18 for more Mobile World Congress news**

In brief

Easier Bluetooth

Bluetooth mono headsets should be cheaper and easier to use thanks to two new modules from CSR, the company claims.

Getting a Bluetooth headset to pair with a phone has been so tricky that people have given up trying, marketing manager Niek van der Dujin Schouten admitted.

"Now we can use a single button press to pair two devices, and the need for inputting a Pin has been taken away," he said at the launch of the modules.

→ **www.pcw.co.uk/2211079**

Evesham resale

The troubles at PC assembler Evesham Technology continued last month after managing director Richard Austin left and an announcement that the brand is being put up for sale. Time and Tiny founder Tahir Mohsan's Dubai-based investment firm, PCC Technology, salvaged Evesham in a $22m (£11.3m) deal last summer when it went into administration.

→ **www.pcw.co.uk/2210497**

Storm millions

The people behind the Storm worm are making millions a day by using it to generate revenue, says IBM's principal web security strategist. Joshua Corman, of IBM Internet Security Systems, said criminals get money for sending out the spam and also get a cut of any business done from it.

→ **www.pcw.co.uk/2209293**

Key issue

Encryption alone is not enough to prevent disasters such as the recent loss of the personal information of 25 million benefits claimants by the HM Revenues and Customs, according to a leading security company. Richard Moulds, executive vice-president of strategy at NCipher, said encryption keys have to be protected as well.

→ **www.pcw.co.uk/2209292**

In brief

Samsung mobile

Samsung showed nothing as exciting as the Origami tablet that was the hit of previous Cebits, but it did show this Core 2 Duo-powered P200 notebook, which it describes as ultraportable. It has a 12.1 WXGA screen and 2GB of Ram, and weighs around 1.9kg, depending on configuration.

→ **www.samsung.com**

Radio headset

Peripherals specialist Logitech is branching out into headsets with this wireless model called Clear Chat, which is designed for VoIP calls via a PC or Mac. It will be available in May for around £75.

→ **www.logitech.com**

TV player

Hauppauge unveiled this portable media player with a 320x240 3.5in screen, mobile Freeview TV with a high-sensitivity tuner, and electronic programme guide. It will be available from next month priced around £110.

→ **www.hauppauge.co.uk**

Write on

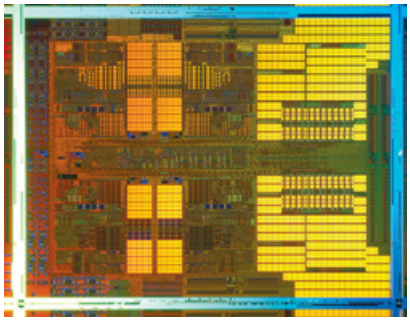
Psylock showed a system allowing a user to be identified on the basis of typing behaviour. You can check the system out at **www.psylock.com/demo**.

AMD unveils first 45nm chips

AMD has demonstrated its first chips built to 45nm scale, which will bring it on a par with the miniaturisation of the latest Intel chips.

The quad-core processors were made at the company's Dresden plant using a process co-developed with IBM. They should help AMD erode some of the technological edge Intel has enjoyed over the past couple of years.

However, Intel is scheduled to start moving to 32nm scale next year and AMD's first 45nm will not appear until later this year.



The chips could help AMD make up ground lost to Intel

The demonstrations at the giant Cebit show in Hanover, Germany, were of a server chip codenamed Shanghai and a desktop one codenamed Deneb.

Highly miniaturised chips are cheaper to make as more can fit onto the standard 300mm wafer used to manufacture them. They also tend to draw less power for a given performance.

AMD also announced new graphics processors, the 780 Series, designed to go on motherboards. The company says that when paired with its Phenom 9000 series quad-core or Athlon 64 X2 dual-core processor, the 780 Series "delivers significant enhancements in gaming and high-definition experiences for mainstream PC customers".

Motherboards using the AMD 780 should be available within the next few weeks.

ATI cards not choosy on pairing

AMD also announced a new ATI driver, Catalyst 8.3, which finally supports CrossfireX – support for more than two graphics cards.

It is a world first because it supports any combination of Radeon HD 3800 cards rather than forcing you to pair identical cards. You can mix two (in some cases three or four) Radeon HD 3850, 3870, 3870X2 cards giving a total of 20 different combinations.

This means you do not need to waste an old card when you buy a new one.

Think the gas supply off

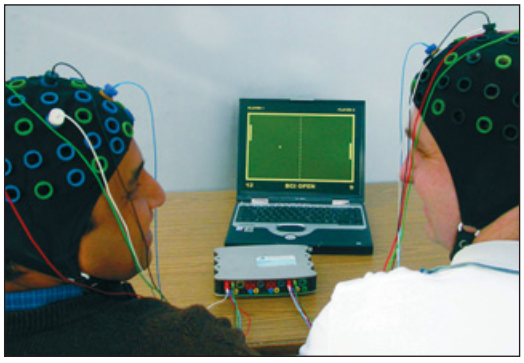
You can stop worrying about whether you have left the gas switched on – new technology will allow you to 'think' it off.

The technology, shown at the Cebit show in Hanover, interprets and responds to neural activity, so you can generate different signals by thinking in different ways. These signals can be used to control anything in your house, say Austrian developers G-Tec.

The system will allow you to switch on the TV, play music, open doors and windows, operate a camera – anything that can be operated electrically. G-Tec says it will be especially helpful for paralysed people trying to live independently.

It can also be used to control a Pocket PC and even to spell out words. But it does require a bizarre helmet containing a number of electrodes – rather less elegant than the thought-control gaming headset from Emotiv (see page 20).

→ **www.pcw.co.uk/2211047**



The G-Tec helmet enables you to control anything that can be operated electrically just by thinking

A Flashy way to back up

Sandisk has launched an Express Card adapter that automatically backs up critical data from your laptop onto a Flash memory card.

The Flashback adapter takes an SD or SDHC card and can hold up to 32GB, encrypting your data on the fly. Backup occurs as soon as a change is made to a file, or when a file is added or deleted.

→ **www.sandisk.com**

Mini laptops follow Eee lead

Seven vendors showed low-cost mini laptops at Cebit following the success of the Eee PC.

Asus launched a revamped Eee PC called the Eee PC 900 with an 8.9in 1,024x600 screen, 1GB of Ram and 12GB of solid-state storage. It will sell for around £100 more than the 7in 701 Eee PC, which came with 512MB of Ram and a 4GB drive. It also came with Linux and Open Office, presenting a challenge to Microsoft to offer comparable software at this price.

Microsoft was at the Eee PC 900 launch of the new version to highlight its use of XP, the stripped-down Works 9 office suite and Windows Live services.

Gecube showed two models aimed at school pupils and home users. The £115 (ex Vat) Genie PC Junior uses a 7in 800x480 display, a 2GB solid-state drive and a detachable keyboard. The Senior version, costing about £140 ex Vat, has a 10.2in 800x600 screen, with a 1GHz C7 processor, a 60GB hard disk and Windows drivers.

E-Lead Noahpad has a 7in 800x480 display and uses a 1GHz Via C7, a 30GB hard disk and a rotatable screen. The keyboard is split into two rigid, touch-sensitive panels. It will sell in April for about $600 (£302 ex Vat).

The Atom-powered Clevo (bottom) and the new Eee PC in a variety of colours

Medion showed a prototype 10in notebook that will sell for around the same price as the Eee PC. UK product manager Rick Munday said it may use Via processors, depending on how much Intel's new Atom processors (see page 20) cost.

Packard Bell's 7in notebook has a similar chassis to the Belinea S.Book (page 59), but has a webcam instead of a VoIP phone. With a 1.2GHz Via C7 CPU, 1GB of Ram and a 30GB hard disk, it will cost around £450.

Clevo released a 7in 1,024x600 touch-panel LCD laptop using an Atom processor clocking 1.33GHz, 1.6Ghz or 1.86GHz. It will go on sale in June.

Amoi showed a 10.2in 800x480 laptop with a full-sized keyboard that will sell for around £300.

→ **www.pcw.co.uk/2211200**

UMPCs still live on in many formats

Mini laptops have not killed off ultra-mobile PCs that follow Microsoft's Origami specifications. Thomas Bauer, a general manager at Microsoft, was careful to say at the launch of the new Eee PC (see above) that the Origami interface was only for 'true' UMPCs.

Keyboards are optional for these but they do need a good touchscreen and stylus for the handwriting recognition to work.

Gigabyte showed two Via C7-M-based UMPCs, M704 and M700, with 7in 1,024x600 touchscreens, 768MB of Ram and a 40GB hard drive.

Most exciting was the MID (mobile internet device) M528 with in-built GPS. It has a sliding Qwerty keyboard, uses an 800MHz Intel Atom processor, 512MB of Ram, a 4GB SSD, a 4.8in 800x480 touchscreen LCD, a VGA webcam, Bluetooth and 802.11g Wifi. It runs Linux and weighs just 340g.

MID range: the Gigabyte M528

This is 200g less than the £530 Wibrain B1H UMPC, which has a Qwerty keyboard and the biggest trackpad I've seen on a UMPC. The impressive specs include a 4.8in 1,024x600 touchscreen LCD, 802.11g Wifi, Bluetooth, a 60GB hard disk, 1GB of Ram and a 1.2GHz Via C7-M processor.

Amtek's U560 uses Intel's 800MHz A110 processor with 512MB of Ram, GMA 950 graphics and a 4.8in 1,024x600 slide-up display. It will sell for around $600 (£305 ex Vat).

Asus released two Atom-based UMPCs running Vista, the 5.6in-screen R50 and the 7in R70. They feature 3G and Wimax support, and pack a digital TV tuner, 2GB SSD and twin webcams. The R70 adds a GPS module.

Vaio takes green PC title

Greenpeace dubbed Sony's Vaio TZ11 the greenest notebook, with HP's Compaq 2710p and Toshiba's Portege R500 coming second and third. Joint greenest desktops were Dell's Optiplex 755 and HP's dc5750, with Fujitsu-Siemens' Esprimo E5720 coming third. Sony Ericsson's T650i was the greenest mobile phone, followed by Nokia's N95 and LG's KE970.

→ **www.pcw.co.uk/2211179**

Dual-Sim phone

General Mobile has launched a phone that can hold two sim cards at once, The DSTW1 allows travellers to hold SIMs for different countries to save crippling roaming charges.

→ **http://tinyurl.com/2y94at**

Zero-Watt monitor

Fujitsu-Siemens showed a monitor that draws no power in standby. The Scenicview P22W-5 ECO, which goes on sale this summer, also includes a sensor that reduces the brightness in a darkened room, cutting the power consumption by nearly a half.

→ **http://tinyurl.com/2kfw99**

USB bottle opener

If you are in the habit of carrying a USB drive and a bottle opener, this 8GB Trekstor USB could save you some valuable pocket space. Price and a shipping date were not available.

→ **www.trekstor.com**

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In brief

Child porn alert

The GSM Association (GSMA), the EU, and the International Telecommunications Union (ITU) have launched a programme to tackle the growing problem of child pornography on mobile networks. Any mobile operator can join the scheme to block traffic from sites which are said to be proliferating.

→ **www.pcw.co.uk/2209353**

Touching sight

You can send images from your cameraphone using MMS directly to this £141 DF7700 picture frame from Parrot. The company also demonstrated a photo frame (see below), a hi-fi system, and a car-kit that pair with a Nokia phone simply by touching it – provided it is a Nokia model supporting Near Field Communication-enabled Bluetooth, which is due to be endorsed as a standard.

→ **www.parrot.com**

Voicemail to text

Nuance, Simulscribe and Spinvox all offered products and services that convert voice messages to text. Spinvox claimed its £5-a-year service target at Blackberry users is 97 per cent accurate.

→ **www.pcw.co.uk/2210408**

→ **http://tinyurl.com2m46zj**

Mobile TV

Orange and T-Mobile have announced plans to pilot jointly a mobile TV service in west London this year using the Multimedia Broadcast Multicast Service based on the TDtv platform from Nextwave Wireless.

→ **www.pcw.co.uk/2209800**

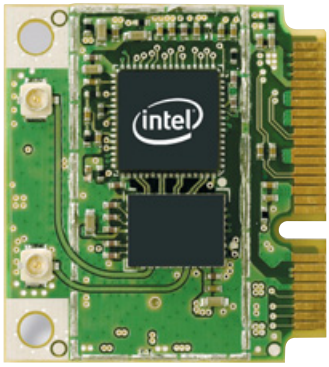
120Mbit 4G to rival Wimax

A 4G technology known as Long Term Evolution (LTE) has emerged as the front-runner for next-generation cellular mobile links in the face of emerging competition from Wimax.

Huawei and ZTE demonstrated LTE data rates of around 120Mbits/sec at Mobile World Congress (MWC). This is faster than figures quoted for Wimax, but in either case the bandwidth has to be shared within a cell and maximum data rates will depend on how the infrastructure is set up – throughput is halved if 10MHz is used instead of 20MHz channels.

Femtocells home cellular base stations (see below) could in theory offer up to the maximum data rate as they are virtually uncontended. Wide-area access would be limited to the speed of broadband lines.

Vodaphone said it plans an LTE rollout by 2010 and China Mobile and US operator Verizon will also support the technology. Giants Alcatel-Lucent and NEC announced a joint venture to pool existing R&D resources and deploy LTE as soon as next year. The technology builds on existing 3G infrastructure.



Intel half-height mini-PCI Express card implementing both Wifi and Wimax on the new Menlow platform

Intel has teamed up with Pipex in Britain to form a company called Freedom4, which is rolling out non-mobile services in cities.

Intel is to implement Wimax on its low-drain Menlow notebook platform later this year using mini-PCI Express cards that also support Wifi. These were on show at MWC (see picture), where Intel was uncharacteristically muted on the subject. A spokesman on the stand said it was possible that the two technologies might converge.

Vodaphone chief executive Arun Sarin called for Wimax to be "harmonised" with LTE.

Companies developing LTE also offer Wimax. Both systems use Orthogonal Frequency Division Multiplexing (OFDM) technology and reference designs at MWC supported both on the same board, with the LTE and Wimax layers done purely in software.

→ **www.pcw.co.uk/2209710**

Maidstone to pilot Britain's first mobile Wimax service

Britain's first mobile Wimax is to be piloted this spring in Maidstone, Kent, by a group of companies called the Mobile Wimax Acceleration Group (M-WAG).

It will test a range of services such as mobile VoIP, real-time high-quality video streaming and live broadcast.

It will also test advanced charging systems and Wifi-to-Wimax handover, allowing you to shift seamlessly from one link to the other as you move in or out of range.

The service will use 2.5GHz bands. A Wimax rollout by Freedom4, a joint venture between Pipex and Intel, uses 3.6GHz and will initially be for fixed links though limited roaming is possible with a cell.

→ **www.pcw.co.uk/2209368**

First UK femtocells stick to 3G system

Operator O2 will deploy some femtocell home cellular base stations next year with the price per unit falling to between £50 and £80 as production ramps up.

The company announced last week that it is starting a UK trial of femtocells, which provide better home coverage for mobile handsets.

John Carvelho, head of core network innovation at O2, said the first femtocell deployment will use 3G HSDPA links offering downstream transfer rates of up to 7.2Mbits/sec, and 2Mbits/sec upstream if HSUPA is implemented.

Novatel showed this Ovation MC950 USB dongle supporting both HSDPA and HSUPA – see www.novatelwireless.com

The system will be closed – that is only authorised householders will have access to it though public places like stadiums may eventually sprout femtocells. The system will not initially support internal links across a home network.

Carvelho said the system might "evolve" to support LTE (see above), but he pointed out that even using HSDPA, downstream speeds would usually be limited by the user's broadband link rather than the wireless. Femtocells will be offered as a part of a bundle of services including DSL broadband, and Carvelho hedged on the matter of charges. "We are currently analysing how to offer a compelling proposition to our customers which may draw on our extended suite of offers," he wrote in reply to emailed questions. For the full text of this Q&A see **http://tinyurl.com/2vvfae**.

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In brief

Wifi blues

Bluetooth is to hitch a ride on Wifi when transfers of images and other large files are required, it was announced at WMC.

Bluetooth maxes out at 3Mbits/sec, much slower than Wifi, but it uses far less power on standby or setting up transfers.

The plan is to marry Bluetooth to ultrawideband (UWB) technology which it will use as a fat data pipe carrying upwards of 400Mbits/sec.

But this will be relatively slow in coming and the governing Bluetooth Special Interest Group sees Wifi as a good alternative meanwhile, particularly as many devices already use both Bluetooth and Wifi.

→ **www.pcw.co.uk/2209294**

Handsets sprout FM

Manufacturers are beginning to pack FM transmitters into mobile phones to enable them to play wirelessly through car radios and home receivers.

The feature is included in Samsung's flagship Soul handset (left), launched at MWC, and in Sony Ericsson's smart new W980 Walkman phone.

→ **www.pcw.co.uk/2209503**

Friend detector

A new Yahoo service uses cellular triangulation or GPS on connected mobiles to tell you when friends are nearby. The service could mean an end to those occasions when you miss friends but Yahoo is aware that it could also mean you being hassled by people you would rather miss.

"We made it so that you are opted out by default. You have to choose to be visible on the system," said Marco Boerries, executive vice-president of Yahoo! Connected Life.

→ **www.pcw.co.uk/2209465**

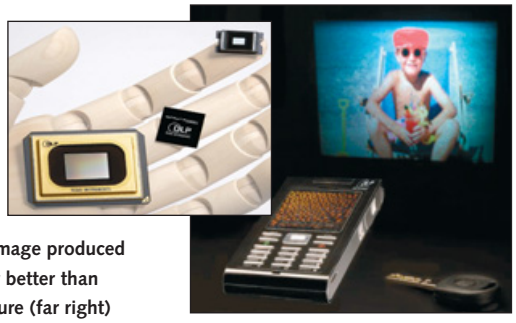
ARM aims elbow at Menlow

Handset makers at Mobile World Congress showed little awareness of emerging new formats such as ultra-mobile PCs and Mobile Internet Devices (MIDS) that could cut into and even take over the market for smartphones.

Even groups trying to promote Linux-based mobiles were focused almost exclusively on traditional handsets, despite the success of the Linux-based Asus Eee PC ultra-mobile costing as little as £190 – a price impossible to achieve using Windows software.

A notable exception was Texas Instruments, which showed a prototype handset using the Android platform developed by the Google-led Mobile Handset Alliance (see box). Senior vice-president Greg Delagi said the new truly portable computers present a tremendous opportunity for non-Intel processors.

The Android prototype used TI's OMAP 3430 system-on-a-chip, which uses an ARM Cortex A8 core and is capable of delivering 720p high-definition video. TI engineers say this is powerful enough to run an Eee-class ultra-mobile running Linux and Openoffice.



TI demonstrated a pico version of its Digital Light Processor chip (right) that allows a handset to beam an image on to a wall. The image produced was actually rather better than appears in the picture (far right)

This means ARM designs could compete with Intel's Menlow platform, which is said to deliver the performance of a 2006 Centrino processor at a tenth of the power (see page 23).

It is hard to see how the two architectures compare because the efficiency of ARM-based platforms would depend on the implementation by manufacturers who license the core designs, according to Ian Drew, vice-president of ARM's solution and segment marketing.

But he added: "Intel talks about how much the processor draws but it does not say anything about the chipset. That draws power too."

Intel showed a quartet of Menlow-based MID prototypes from different manufacturers.

Similar ARM-based products could let Far Eastern chipmakers into the mainstream processor market as they can design their own systems-on-a-chip around ARM cores which have a large developer community and toolset.

Limo products overshadow Android handset challenge

The Google-backed Open Handset Alliance's Android handset was rather overshadowed at MWC by products based on the rival Limo Foundation's platform. The only Androids on show were prototypes, whereas the Limo camp could boast 15 phones, two reference platforms and just one prototype. The Android interface uses scrolling icons to navigate features (see picture).

NEC showed four Limo handsets targeted at the Japanese market and Motorola showed two. Limo has now published its programming interface and plans to release a software development kit later this year.

Android interface uses scrolling icons

Mobiles give designers a moving target

The browser has lost its ability to be all things to all devices as the web goes mobile, according to the company behind the .mobi domain.

Web designers complain about the differences between desktop browsers though these differ in only five to 10 per cent of their features, said Dotmobi chief technology officer James Pearce.

"The problem with mobile browsers is that there are hundreds of different types of handsets around the world. Among them there are probably 10 to 15 key types of browser and 20 to 30 types of screen ratio and screen size. If you want to provide a consistent experience you have to send Flash to this handset, Javascript to that one, and Ajax to the iPhone."

Pearce believes that the issues will be ironed out within a couple of years, by which time new problems would appear.

Dotmobi has launched a Device Atlas for developers who want to know the characteristics of handsets in its database. A number of other tools are available at its developer site.

→ **www.pcw.co.uk/2209974**

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In brief

Neuro-headset

A headset that allows you to use thought power to control a game will go on sale later this year priced at $299 (£151). It is said to be able to register more than 30 different facial expressions, emotions and actions by interpreting neural activity. Manufacturer Emotiv Systems is offering a development kit for games engineers.

→ **www.pcw.co.uk/2210091**

Chicken-wire chips

Transistors made from a form of carbon found in pencils could be used to create processors clocking hundreds of times faster than today's silicon-based products, according to a US researcher. Graphene, which consists of layers of a two-dimensional chicken-wire mesh of carbon atoms, has a much lower resistance than silicon and is a good thermal conductor.

→ **www.pcw.co.uk/2210414**

Director 11

Adobe has launched Director 11, a major upgrade to its flagship multimedia authoring tool. New features include support for Adobe Flash 9 and an enhanced script browser to save programming time. Director 11 will cost £705 ex Vat (£209 ex Vat for educational buyers or as an upgrade).

→ **www.pcw.co.uk/2209954**

Linux-based Dell

Dell has added the Inspiron 1525 notebook to its range of notebooks using Ubuntu Linux.

→ **www.pcw.co.uk/2210100**

AMD opens up

AMD has open sourced its AMD Performance Library (APL), also known as Framewave 1.0 in a move that it says will facilitate the development of high performance applications.

→ **www.pcw.co.uk/2210035**

Intel unveils tiny frugal Atoms

Intel has revealed more details of low-drain processors due for release this year – and announced that they are to be branded Atom.

The processors, which use an architecture completely revamped for efficiency, are designed for PDA-sized Mobile Internet Devices (MIDs) and what Intel calls a new class of affordable, infocentric mobile computers Intel has called netbooks.

These are far from a new idea. Acorn and National Semiconductor were making what were called webpads more than a decade ago, and recently the Asus Eee PC has demonstrated a market for the format. Intel envisages a desktop version called the Nettop.

The new portable platform codenamed Menlow will be branded Centrino Atom, a term which embraces the peripheral chips as well as the processor.

The chips will use the Core 2 Duo instruction set, and will clock up to 1.8GHz. The breakthrough is that they have a thermal design power (TDP) of between 0.6-2.5 watts – that is the power drawn when the processor is run flat out. Mainstream Core 2 duo notebooks have a TDP of 35 watts.

The new 45nm-scale chips, previously codenamed Silverthorne and Diamondville, measure just 25 square millimetres and use the latest hi-k metal gate technology.

Intel chief sales and marketing officer Sean Maloney described them as a fundamental new shift in design: "We believe it will unleash innovation across the industry."

→ **See ARM aims elbow at Menlow – page 18**

Skulltrail leads to 'fastest' PC

Intel has released an eight-core platform for "hard-core gamers". The Dual-Socket Extreme Desktop Platform, codenamed Skulltrail, consists of a D5400XS motherboard designed to take two quad-core QX9775 processors and work with NVidia SLI or ATI Crossfire yoked graphics cards. A single QX9775 costs $1,499 (£750) ex Vat and the D5400XS will cost an estimated $649 (£326).

The QX9775 packs 12MB of L2 cache, a 1600MHz system bus and clocks 3.2 GHz – or faster, because overclocking protection has been removed.

Toshes let you in if they like your face

Toshiba is including face-recognition technology with its latest range of webcam notebooks.

If the notebook 'recognises' you it will allow you to use the machine without giving your password. The company says the software can work out if someone is trying to use a life-size photo in a bid to get round the system.

The new range includes the Portege R500, which Toshiba claims is the world's light notebook at 779g – though a version with a a 7mm optical disk is heavier.

Compact Gigashot HD camcorder (left) and the R500 laptop

Toshiba also launched a range of compact video cameras, including the Gigashot A series which captures 1080i high-definition MPEG4 and has a 10x optical zoom. The Gigashot £679 (inc Vat) A40F and £849 A100F pack a 40GB and a 100GB disk respectively. For more on these see **www.pcw.co.uk/2210257**.

Nvidia touts £100 high-power graphics processor

Nvidia claims its first Geforce 9 graphics processor offers the largest single-generation performance jump in its history – 116 per cent over its predecessor.

The Geforce 9600 GT is designed to offer immersive gaming with "incredible" graphics to gamers for less than $199 (£100).

Ujesh Desai, general manager of Geforce desktop GPUs, said it gives them the horsepower to play cutting-edge DirectX 10 games at a price they can afford. Rival ATI's latest cards support DX 10.1.

Nvidia said the graphics on games such as Call of Duty 4 and Unreal Tournament 3 have stretched lower cost graphics processors at resolutions of 1,900 x 1,200 and above. The company's PCI Express 2.0-compatible 9600 GT is more efficient on power and compression than its predecessor. It packs 64 stream processors clocking 1,625MHz, and a 256-bit memory interface running at 900MHz. *Clement James*

3.5G High-Speed Data

DrayTek now provides optional support for GPRS and HSDPA cellular connections, now available from most UK cellular operators at up to 1.8Mb/s. This means that you can get broadband speeds without needing a fixed line, ideal for mobile working, temporary locations or backup to your main broadband feed.

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£608m fine mars mega launch

The European Union fined Microsoft a record £608million last month, overshadowing what the company described as its biggest-ever product launch.

The news broke shortly before the start of a London event marking the launch of three flagship enterprise products (see below). And it came less than a week after Microsoft chief executive Steve Ballmer announced a new era of openness in which the company's programming interfaces would be available to rivals – though they are still liable for royalties.

The EU Competition's reaction to this announcement was: "We have heard it all before."

It said in a statement that it would welcome any move towards genuine interoperability but Ballmer's statement followed at least four similar ones by Microsoft on the importance of interoperability.

The EU fine was for failing for more than three years to comply with a 2004 order to open programming interfaces and communications protocols to rivals at a reasonable price.

It was fined $357million in July, 2006, on a similar count and last October it offered rivals a flat-rate deal on interoperability data, after the EU complained that it had set royalties too high.

Microsoft said later that it may appeal against the fine.

The company's new open-door policy will make it easier for developers to get hold of documentation, application programming interfaces, and communications protocols to allow non-Microsoft code to interoperate with Windows.

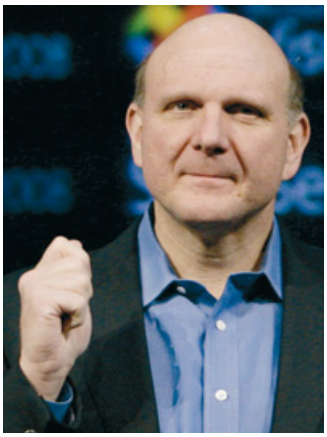
It could also, curiously, help Windows applications to run over Linux using WINE, the open-source implementation of the Windows interface.

Ballmer shrugs off fine to push Server 2008

Microsoft blessed the launch of its latest enterprise products with the slogan 'Heroes happen here'. The reason was not entirely clear, unless the company meant to warn us that heroic efforts are required to make them work.

Chief executive Steve Ballmer was, however, heroic in shrugging off the £603m kicking he had just received from the EU (see above) as he launched the 2008 versions of Windows Server (WS08), Visual Studio (VS08) and SQL Server – though the latter will not appear until later this year.

Also not available for some months is a final version of WS08's anticipated Hyper-V virtualisation engine, which is still in beta.



Ballmer waxes heroic at the WS08 launch

WSO8 boasts better security, tight integration with Vista and Windows applications, and integrated support for Internet Information Server 7.0. Companies are not expected to start adopting it for at least a year.

New features of VS08 include support for Javascript debugging and Intellisense, which saves programmers work by second guessing what they are writing and autocompleting it.

To get that EU fine in perspective, it represents less than the third of the revenues drawn by Microsoft's sever and tools division in the space of three months.

Microsoft awaits verdict on Open XML standard

A standards committee spent five days last month sifting through proposals that could see Microsoft's new Open XML formats formally adopted as a global standard – or not.

A vote by standards bodies from 87 countries last September went against the immediate adoption of Open XML as an ISO standard. This gave an immediate boost to the Open Document Format (ODF), which is already an ISO standard, but it did not rule out adoption of the Microsoft formats.

The ISO process went on to a second stage in which objections to Open XML, which had to be set down in writing by those voting no, were sent back to Microsoft to see if the problems could be resolved.

Proposed amendments to the specification, which runs to 6,000 pages, were put to a committee to agree a final specification. The result should be known by the end of March.

Jason Matusow, senior director of interoperability at Microsoft, said that even if it goes against Open XML the standards process will not have been a waste of time. "It has actually produced a far better specification," he said.

In brief

Free software

Microsoft is offering free developer and designer tools to students in a bid to stave off the advances made by Linux and other open source software. It says that the Dreamspark initiative will be expanded over the coming year to reach more than one billion students worldwide.

The programme will offer Visual Studio 2008 Professional Edition, Expression Studio, XNA Game Studio 2.0, SQL Server Developer Edition, Windows Server Standard Edition plus other software and resources.

→ **www.pcw.co.uk/2210098**

SP1 blacklist

Microsoft has posted a list of programs that will not work properly with Service Pack 1, the first major update for Vista due for release in mid-March – and warns that the list may not be comprehensive.

On the menu are: Bit Defender AV or Internet Security version 10; Fujitsu Shock Sensor version 2.1.0.0; Jiangmin KV Antivirus 2008 and version 10; Trend Micro Internet Security 2008; Zone Alarm Security Suite version 7.1.078; Iron Speed Designer 5.0.1; Xheo Licensing 3; Free Allegiance 2; NYT Reader 1; Rising Personal Firewall 2007; Novell ZCM Agent 10.01. Microsoft provides links to fixes for most of those listed at **http://support.microsoft.com/kb/935796**

Cougar revealed

Microsoft has revealed details of Windows Small Business Server 2008, codenamed Cougar which is due for launch later this year. The new version, aimed at smaller organisations with up to 50 PCs, improves security, access to online services, and integration with Exchange Server 2007 and other Microsoft products.

→ **www.pcw.co.uk/2210314**

INTERACTIVE

LETTERS

Send your letters to The Editor, *PCW*, Incisive Media, 32-34 Broadwick Street, London, W1A 2HG **Send your email to** letters@pcw.co.uk

LETTER OF THE MONTH

A bad year for HD DVD

It's looking like a turbulent year for HD DVD, what with the Warner Bros' announcement in January that it would exclusively back the rival Blu-ray format. It has also suffered from DVD rental giants Netflix and Blockbusters phasing out the format, American retailer Best Buy's recommendation of Blu-ray over HD DVD for consumers, and Walmart's decision to support only Blu-ray from June 2008.

Just days after reading Gordon Laing and Barry Fox's articles about the HD format war, I learnt that Toshiba (HD DVD's main backer) had announced that they would no longer develop, manufacture or market HD DVD players from March this year. This, I feel, must be the tip of the high-definition iceberg in favour of Blu-ray, as Toshiba's pull-out effectively ends the format war.

I feel for Laing. In his piece he referred to the VHS/Betamax format war lasting for years, and stated that "we could be in for a long ride yet" in this new race for high-definition supremacy. It now seems that this ride has been cut very short. After all the money and time put into the successor to DVD by Toshiba and various other companies, not to mention the consumer spending upon the technology, it seems such a waste. But every battle must have a victor, and, just like VHS, Blu-ray has won both the battle for manufacturer backing, and in turn the war.

Being an owner of Sony's £300 Playstation 3, which supports Blu-ray playback, I am somewhat pleased that the outcome wasn't the opposite. I do not wish to gloat, but this is a definite reassurance that the money I spent on a next-gen console was spent well. Although I do not own any Blu-ray films, I feel content in the knowledge that my PS3 will be able to play high-definition films in the future, should I feel the need to watch them.
Loz Hawksworth

HD DVD has now finally been abandoned

CRACKLY LINES

I have had about 12 months of difficulty getting a completely reliable connection since I was switched to the ADSL Max service (up to 8Mbits/sec).

In that time I found out that the crackly phone that had crackled for years was seriously reducing the speed of my connection as the interference, on occasion, was so severe it would reduce the speed to 100Kbits/sec, which the exchange would not reset until 24 hours later. Also, the connectors that are sold for DIY extensions are not without their problems and the reason why you have the option of loading any version of the router's firmware that has been issued in the past as well as the most recent version, is that sometimes the older version is more stable for your connection than the most recent version.

Fortunately I have experience of electrical fault finding and eventually found a workable solution to overcome the intermittent problems I had. However, even for me it has not been easy. BT was adamant that the line was satisfactory and, if I were to book a visit, I would be charged £180 if it felt that the problem lay at my end. I do not see how a competent telecoms technician could take longer than half an hour in such a visit and this charge is in excess of its actual cost.

For many users, a visit from BT may be their only option because many problems are beyond the competence of the average user.
Neil Hardy

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HISTORIC COMPUTERS

The article about Colossus and Bletchley Park reminded me of my early days in IT.

In 1968 I operated an Elliot 803, before the company, a poultry breeder, moved to an ICL 1901A. What a machine that was; it filled a large room but had only 8KB of memory ('store' in those days). All input and output was on eight-track paper tape, even the printed output that then had to be fed into a free-standing 'Creed' printer that had a tape reader attached.

On the night shift when there was no manager around, we used to feed the paper tape straight from the paper tape punch into the printer's tape reader, across the floor and into the next room.

We corrected keying errors by plugging holes in the paper tape or punching new holes. Storage consisted of two very large tape decks (one input, one output) with a difference: the tape was magnetic-coated 35mm film that was fed under a head with a very precise head gap.

If the gap was wrong, the tape could not be read as the film would not touch the head. The computer was controlled by a large console with many buttons on it, including one labelled "Clear Store" – and that is exactly what it did.

Rows of buttons represented bits in a word (39 bit words), and could be set to pass 'parameters' to a program; only one could run at a time. The machine was programmed in machine code or Autocode.

In spite of its limitations, it was used to calculate payroll and perform genetic calculations. The good old days? Hardly, but interesting to look back on now.

I for one would like to see the Elliot 803 at Bletchley Park.

Rod Theobald

EARLY PREDICTIONS

I was one of the early readers of *PCW* but I couldn't afford Pet, Apple or Tandy as they cost six months' salary. I saw an advert for kit called the UK101 for £100, but you only got a bare motherboard and had to solder all the components, including the keyboard. It was a reasonable price if it worked, but a waste if it didn't. I found a shop that offered to fix any faults for £10 which meant I was more or less getting a working computer for £110.

It certainly worked, but it didn't do anything as you had to write all your own programs using the built-in MS Basic.

Back then, PCW had a regular column for UK101 users and, month by month, I learnt how to write or modify programs. There was a great camaraderie among users who helped people solve problems.

I remember the predictions – a laser printer for under £1,000. Oh, how we laughed as a simple nine-pin dot matrix printer cost £450 at the time.

The suggestion in Issue 3 about the computer to help deaf children hear seemed like science fiction at the time, but I now have a cochlear implant which enables me to understand speech although I am completely deaf.

It is smaller than a Bluetooth headset that fits behind the ear. Most deaf children are fitted with them before they go to school and I don't think anyone would have dreamt that possible in the 1970s.

Derek Trayler

BATTERY LIFE EXPECTANCIES

I've read many reviews of laptops and quite a few mention battery life in terms of the number of hours use on a full charge. I've not seen any comparison of the life of the battery in terms of how long it lasts before you have to replace it, as opposed to recharging. I know that this is not a simple 'test one machine and get a representative answer', but it would be a useful industry standard. Maybe you have enough readers who would contribute data so some conclusions could be drawn.

The actual life expectancy of a battery isn't easy to calculate

My own experience consists of three laptops. All used for a similar mix of applications, all went through a careful charge cycle before first use, and all used predominantly attached to the mains.

My results were one Compaq Evo that was still giving three hours useful service when the machine was stolen at four years old, and two Dell Inspirons that both had hardly enough life to boot the machine with the battery at just over six months old. Not a statistically valid sample, but enough to suggest that there may be a brand dependent cost of ownership issue with the battery life.

Tony Corless

WIFI WORKAROUND

On a recent trip to Spain I subscribed to the local Wifi service at €45 for 14 days. I then encountered the usual SMTP relay problems for my email – even web based mail caused some issues.

However, using Thunderbird I changed the outgoing SMTP to my Googlemail setting, using SSL and port 465 with security and authentication ticked.

This allowed me to send mail from my Virgin, Onetel and Gmail accounts.

Ann Edwards

Back in 1978 the Apple II was impressive, but also expensive at £1,250 ex Vat

WIN Next month's prize for the letter of the month is a Sapphire 3850 Ultimate

Next month's prize for the letter of the month is a Sapphire 3850 Ultimate worth £160.

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Gordon Laing

gordonl@pcw.co.uk

The aftermath of war

Sony's Blu-ray has won the HD format war, but what does that mean for early adopters who chose its defeated rival, HD DVD?

On 19 February 2008, Toshiba announced it would discontinue its HD DVD business. As the major backer of the format, this essentially ended the HD format war. Within 24 hours, statements received by Hollywood media claimed HD DVD's remaining studio backers, Universal and Paramount, were also pulling out of the format and, like Warner Brothers, backing Blu-ray instead. Sony had won the war and once again I found myself with a player which had effectively become obsolete.

After years of suffering format defeats, it could be argued that Sony deserved a break. It lost the VHS versus Betamax battle of the 1980s, DAT (Digital Audio Tape) was forced into niche markets due to lack of pre-recorded content and Mini Disc failed when MP3 players and the Apple iPod became dominant.

'Once again I found myself with a player that had effectively become obsolete'

With each defeat, Sony learned an important lesson and the first was having content for its new platforms. By owning music and movie studios, Sony could guarantee there'd always be content for its own formats. This, however, wasn't sufficient to win the Blu-ray versus HD DVD war. While backing from the other movie studios was essential for long-term success, the catalyst for their support was a larger installed base of compatible players than its rival.

By producing one of the leading games consoles – the Playstation 3 – and equipping it with a Blu-ray drive, Sony ensured a large number of homes could play its new HD disc format even if few owners ever intended to. This installed base of HD-capable players turned the tide in favour of Blu-ray, which in turn attracted support from movie studios and retailers.

Arguably the first nail in HD DVD's coffin came when Microsoft decided to fit its Xbox 360 console with a plain DVD drive and only offer HD DVD as an optional peripheral. Had the 360 come out with a built-in HD DVD drive from day one, the outcome could have been very different.

Sony's format has emerged triumphant. So where does that leave anyone who, like myself, invested in HD DVD hardware and titles?

Like all defeated formats, new releases will grind to a halt at some point soon, but existing titles don't suddenly stop working. Any HD DVD movies you own will continue to play on your hardware, of course while the hardware itself remains operational. As a self-confessed early adopter, I bought a Laserdisc player, DAT recorder and a Mini Disc portable, and only recently sold off my Betamax. All still work.

Operational is the key word though, as once the hardware of a defeated format gives up the ghost, you'll invariably find it harder to fix or replace. Toshiba says it will provide full support and after-sales service for all owners of Toshiba HD DVD products, but for how much and how long? There certainly won't be any new players to replace them or upgrade to in the future.

If you have a significant investment in HD DVD titles, you might consider buying a backup player. At the time of writing, prices on HD DVD hardware and software hadn't fallen significantly, but bargains are sure to be had before long. You can't legally back up your titles onto your PC using an Xbox HD DVD drive and play them from there, so that's another option out the window.

As I mentioned in last month's column following Warner Brothers' announcement, I'm disappointed that HD DVD lost, as unlike Blu-ray it was a finished standard with affordable hardware and no regional coding. Of the two formats, it's also the one I have a bigger personal investment in, but with my Xbox drive costing £90 and 15 imported titles working out to around £10 each, it's not as bad as it could have been.

Ultimately I'm happy there's a resolution to this latest format war and hope new Blu-ray titles and affordable players become widespread sooner rather than later. Sony must also realise it now has a limited window of opportunity to sell HD in a physical format. Mainstream HD downloads aren't far away, while anyone with a newsgroup subscription and little respect for copyright has enjoyed access to plenty of HD material for a long time. So the big question is, if you've been sitting on the fence, will you now buy into Blu-ray? **PCW**

Barry Fox

barryf@pcw.co.uk

Giants under threat from minnows at CES

Airport security and the success of the tiny Eee PC may well prompt consumers to move from Microsoft Windows to Linux

Gary Shapiro, head of the Consumer Electronics Association in America which stages the Consumer Electronics Show (CES) and saw off Comdex, justifies the topsy-turvy growth of the sprawling event: "The beauty of shows is that anyone with an idea and very little money can be exposed. Bill Gates succeeded because of Comdex."

I thought about this when I was doing what I always do when attending CES; taking advantage of the fact that not even the exhibition's staff can decode the crazy aisle and booth numbering system, getting lost on the show floor and letting serendipity take over.

One small stand was showing equipment from the One Laptop per Child (OLPC) project. This will give children in developing nations a chance to learn IT skills and communicate. It has been viewed by some adults in developed nations as a sneaky cheap option for business use.

'If Microsoft tries to force migration to Vista, more people will try Linux'

Now I don't think so. The tiny keys will remind those with long memories of the early Sinclair computer keypads, once famously described as like shaking hands with a dead man. OLPC really is for children.

Not far away another small booth was demonstrating the Asus Eee PC, which will remind the same long-memoried of the first real portable PC, the wonderfully easy-to-use Tandy TRS-80 Model 100. A4 size, the 100 had a solid-state operating system from Microsoft in pre-DOS and Windows bloat days, a feelgood keyboard, small mono LCD screen and built-in modem (300bits/sec!). It switched on and off at the flick of a slider and ran for weeks on AA cells.

Compare that to a modern laptop with Windows which takes the first half of a plane trip to boot up, the other half to shut down and drains its rechargeables while doing so.

The Eee PC is half the size of most notebooks, weighs less than 1kg, is solid and comes with quick-boot Linux built to look like Windows. The keyboard is small but usable by adults.

Airport security is making it increasingly difficult to carry a full-sized laptop as hand luggage. So the first thing I did when I got back to the UK was go out with £220 to buy an Eee PC. But even before *PCW*'s rave reviews had hit the newsstands, every shop and website had completely sold out and PC World was not even taking orders.

I solved my problem by buying an end-of-line Packard Bell Easynote, which is around the same size and weight as an Eee PC, costs (on special offer) around £350 and is blessed with Windows XP rather than Vista. It's slow but lets me escape the clutches of Vista. So my working tool's Windows software still works.

Other companies now seeing the queues to buy Eee PCs are sure to launch Eee clones. This will stimulate the release of Linux versions of working tool apps. So the Asus punt may well have kick-started Linux as a consumer alternative to Windows.

Microsoft mishandled the Vista launch, with the press embarrassed into begging for review copies of software that turned out likely to screw up their PCs. I was in a BBC studio recently and the PCs were all still running XP. Many businesses are still using XP. NEC is now offering the option to use XP on new machines instead of Vista.

If Microsoft tries to force migration to Vista, more people will try Linux and discover that there can now be life without Windows.

There is a lot of conflicting information on the web about the shut-off dates for XP. I am not surprised because, when I asked Microsoft for horse's mouth comment, what I got back was bewildering. I decoded and distilled, and asked Microsoft to confirm that my simple interpretation was correct. It was, so here it is.

Service Pack 3 for XP is due some time in 2008; retail sales of XP end in June 2008 and there will be no new PCs with XP after January 2009. From then on there will be five years of bug fixes and ten years of security updates. So XP will continue being tweaked for best performance until January 2014, and XP will get security updates until January 2019.

The bottom line is that there is absolutely no need to go Vista yet unless you want to. **PCW**

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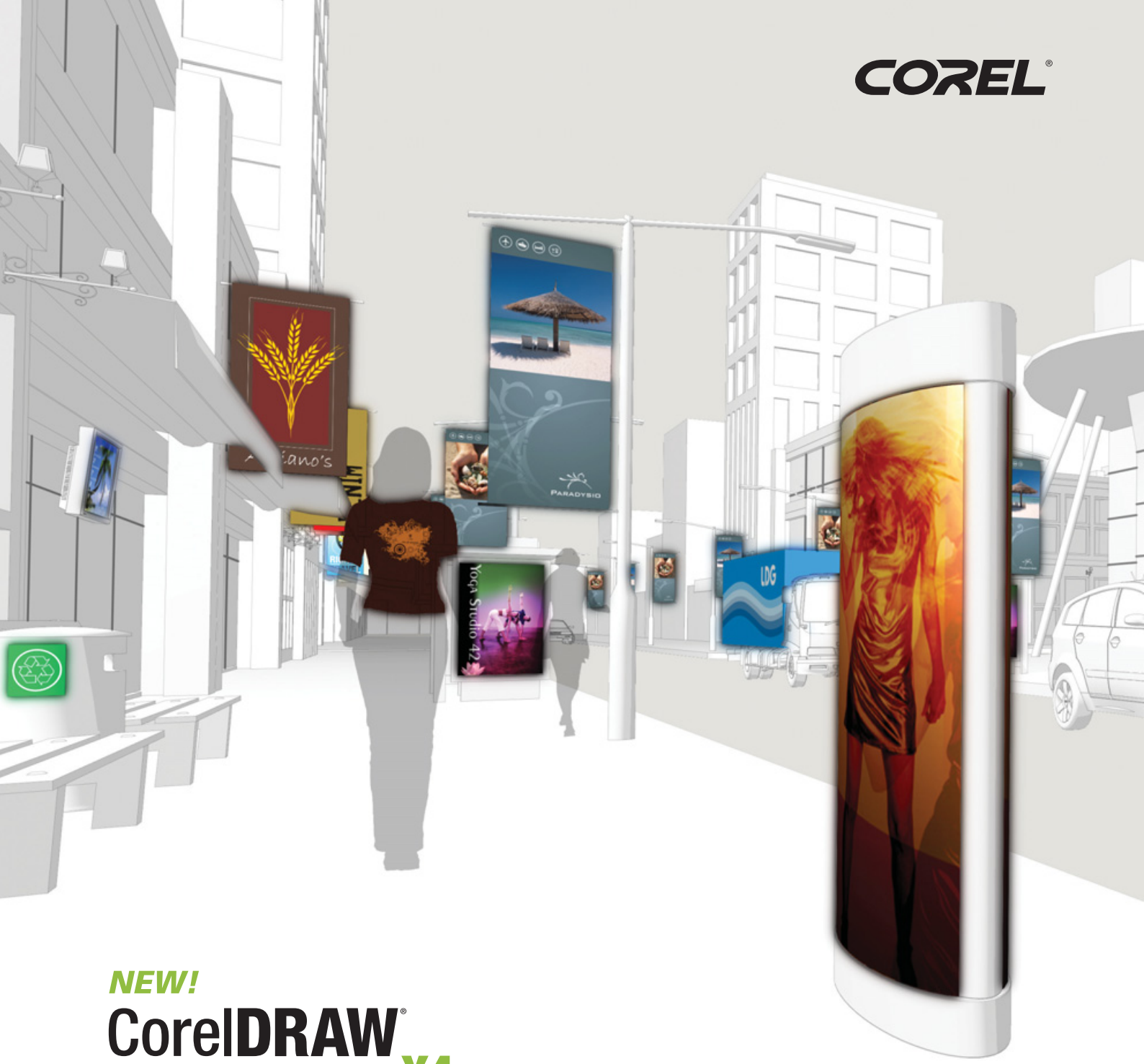

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The demand for XP will continue

In June, Microsoft stops selling Windows XP, but is it worth investing in a little operating system insurance before then?

Let's make a resolution: let's put some money in Microsoft's pocket. Specifically, let's go out sometime between now and June and buy a copy of Windows XP Pro. It's insurance: it means that if we find ourselves stuck with a dead PC after June, we won't have to use Vista unless we want to.

Vista isn't quite as bad as it is painted. There's a lot of 'anti-hype' about, and this is pretty standard when a new version of Windows comes out. People are familiar with Windows 95, so they don't like Windows 2000 (W2K); people get familiar with W2K and regard XP as unstable; and finally, people are happy with XP, and find Vista confusing. It's human nature to like what you are familiar with and to be suspicious of change – and quite a lot of anti-Vista comment really doesn't amount to much more than this.

'Those who really can't run Vista on their old PCs will get a new PC and want XP on it'

But beyond that, there is evidence which can't be avoided.

Is it true, for example, that Microsoft deliberately put 'Vista Ready' stickers on new PCs which were not up to the job? If so, was this done to keep on the right side of Intel, which was getting snugger and snugger in bed with Apple at the time? I think the evidence, on balance, suggests that people were buying machines which would give them a bad Vista experience, certainly, and Microsoft can't escape blame for that.

It's certainly the case that Microsoft badly wanted Vista to be a success. Mainly, I think, it wanted to have the new package out there because it would be much harder to make illegal copies – again, the evidence is that this strategy to reduce piracy has been a success. Did this make Microsoft blind to serious problems with the rest of the Vista strategy? It's clear, a year after the Vista launch, that the sceptics were correct.

When the people at the top of Microsoft are discovered to have been writing memos asking why there are so few device drivers after so much development time, we're entitled to point to their public statements in the same months. Those public statements said "there will be drivers" – a statement they knew was wrong. A year on, there are still serious issues for people in running software they need on peripherals they spent money buying and those issues should be history.

I knew Microsoft was living in a state of denial a few months before the launch, when I sat through that famous pre-launch presentation, where senior execs explained their strategy:

"We will sell loads of Vista to corporate buyers, and then they'll go home and they'll want to run the same great software on their home machines, and that will boost sales," they said. They knew, as well as I did, that this was fantasy.

Corporate sales have always lagged domestic sales, and company IT departments have been dragged into the new era specifically by the opposite trend: by senior execs who have the new software on their home machines, and want to run the same software at work. Heck, I know corporations still running Microsoft OS/2 and Windows NT4.

All this, and more, is public record stuff. Wishful thinking of that sort is heavily documented and cynical propaganda talking about the number of copies sold – as if the customers were given any choice of buying anything else by anybody except Dell impresses nobody except the Microsoft PR department.

What will happen, of course, is predictable. June will come, Microsoft will stop selling XP, and those who really can't run Vista on their two-year-old PCs will get a new PC, and want XP on it. And the only copies available will be illegal pirate copies. So they'll either buy "genuine official XP" off Ebay, or they'll just use their original XP and not activate it. Either way, Microsoft will be able to stand up and say that there's no market for XP.

So why don't we prove them wrong?

Think of it as money spent on a spare tyre. You hope you'll never need it, and you will try to avoid having to use it. And yes, it puts money in the bank accounts of people who probably don't deserve it – but in the end, it will tell Microsoft, more clearly than any number of press articles, something terribly simple: "There's still a market for XP. Please satisfy it." **PCW**

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The best things in life are free

You don't have to spend a fortune on essential software. Chris Wiles looks at some of the best tools money can't buy

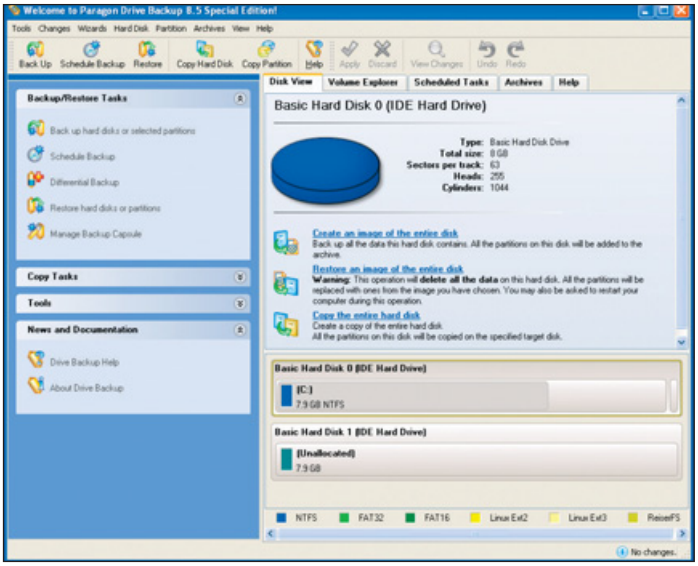
There was a time when you could enjoy spending time searching for new software, installing and then removing it from your computer until you found the perfect applications for a particular task. But thanks to the rise of spyware, malicious software and fake websites, many of us have decided we don't have time to worry about the potential security issues, so we tend to stick with the software we know and trust, even though there may be free and better alternatives.

So, here at *PCW*, we've used our expertise to find, test and provide a collection of some of the very best applications, saving you the worry and hassle involved in tracking down the right tools. If you've previously used one of *PCW*'s 8GB dual-layer cover DVDs, you'll know all about the Resources section, which is updated each issue. As part of our 30th anniversary celebrations, we've now completely redesigned that section, with 119 applications in 11 different categories. This software is primarily freeware, but there are also three exclusive versions of commercial products and five trial products. All are completely free of viruses and spyware and we'll be updating the collection, when software is revised, on future editions of your cover DVD. We'll also introduce other new applications when we find things that we believe will be useful for readers, and you can also suggest software that you think should be included. We welcome your feedback and criticism.

Finding the programs on the cover disc is easy. You can put the DVD in your drive and click on the Resources tab at the top of the disc interface menu, or simply locate the Software/Resources folder in Windows Explorer, and then explore the sub-folders.

On the following pages we'll cover some of the highlights from our collection, and on page 38 there's a table listing all the programs we've chosen.

For those purchasing the CD edition of the magazine, we could only squeeze in two of the most popular categories (Optimisation and Diagnostics plus Security, comprising 23 programs), but we've included a spreadsheet ↘



Drive Backup can create complete system backups quickly and easily

version of the table complete with clickable URLs, so you can download individual programs that interest you.

BACKUP AND RESTORE

Before you install any new software, you should always back up your most important information, data and work files – and you should take regular backups too, in case of disaster or just an accidental press of the delete key. We've included various backup tools that will either enable you to back up individual files or your entire drive or partition on the DVD. If you encounter problems in the future, we've also included applications that will enable you to restore these files or move back to a previous revision of your drive partition. If you have serious drive issues, there are tools such as the System Rescue CD or Ultimate Boot CD that you can use to boot from and fix your PC, even if Windows won't start.

Paragon Drive Backup 8.5 Personal SE

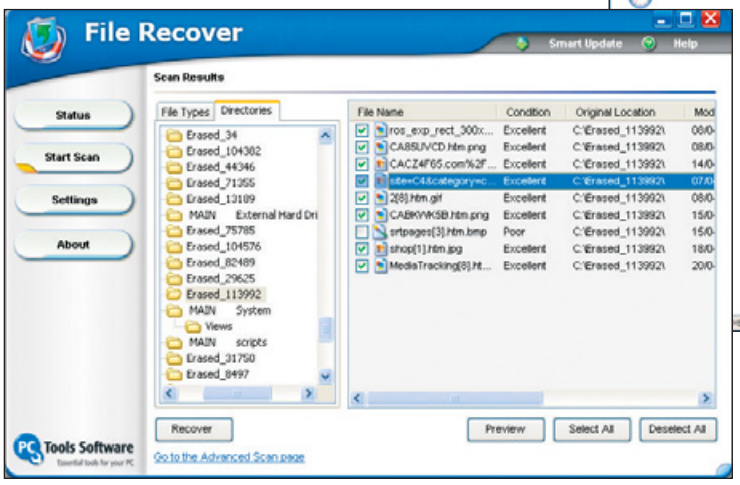
Backing up individual files isn't always sufficient if your system contains one drive partition, which includes Windows, your media files and important personal information. If you work in design, for instance, you'll often forget that the most important element of your work could be the commercial fonts, stored within your Windows folders. Lose this data and you'd have to spend time sourcing your original fonts, which could be very time consuming.

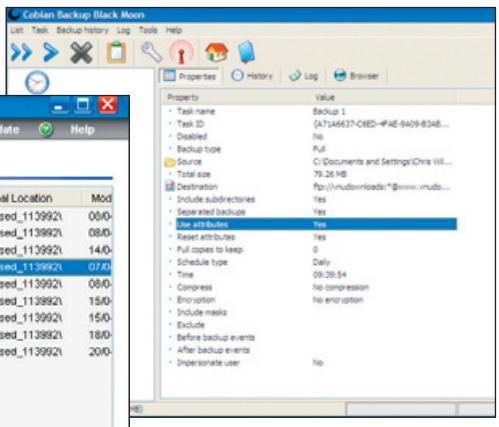
For this sort of reason, it often makes more sense to back up a drive partition rather than individual files. You could schedule a backup routine that will automatically back up your partition at the end of every working day or week. The first time you run the procedure you'll need to back up the entire drive.

However, the next time you back up the same drive, your system will just take copies of the files you've updated, or those new to your drive, then back them up to the chosen location. This means that if you back up your drive regularly, the whole procedure should take minutes, rather than hours.

Indeed, you may find that a drive backup is a quicker procedure than backing up your individual files each time. This is called incremental or differential backup and is supported by both Paragon Drive Backup and Acronis True Image 11, probably the two best drive backup tools on the market. Both are included on the disc; Paragon Drive Backup 8.5 Personal SE is a commercial application, previously sold for £25, whereas the Acronis software is a trial version.

Restore accidentally deleted files with File Recover





Above: Cobian Backup is a flexible and powerful backup system

PC Tools File Recover 6.2

Anyone who works with media files will tell you it's way too easy to simply lose some of your most important data. If more than one person uses your digital camera, your SD card can quickly be filled by holiday snaps. Instead of asking whether you've downloaded the photos to your computer, someone could simply erase your card and start taking new photos.

Downloadable audio files can also be lost easily when you move to a new computer, or copy them across to an external drive. Spend time purchasing your favourite tracks, accidentally delete some of the audio files and you won't be able to go back to the music store and download the purchased audio again without paying.

Luckily, files dragged to trash or deleted on your system can be recovered with the right tools. We've included PC Tools File Recover 6.2, which is Vista-compatible file recovery software, worth £20. Simply run this tool to analyse your drive or removable storage to find and recover deleted files.

Cobian Backup 8.4

You probably received a free home page with your broadband connection, but how many of us use this free web space? All too often, we don't need it for a home page – thanks to the rise of social networking, we'd rather use Facebook or Myspace.

However, with as much as 200MB of free web space from some ISPs, you could turn this into a remote drive that could be used to back up your most important work files.

The other advantage of using a backup tool to copy your work files to remote web space is that you can access them from any location, as long as you

have internet access. Back up your latest presentation, then download it to your laptop, while you're on the train or sitting in a hotel on a business trip.

Finding the right backup tool isn't easy. We recommend the free Cobian Backup 8, which can be used to back up and restore individual files. You can choose the files and folders to copy, schedule an automatic backup routine and choose a destination. The destination can be an external drive, a removable USB memory key, web space (via FTP) or an optical disc. If you experience problems or want to access the files on another machine, you can then use Cobian Backup to restore the files.

Ultimate Boot CD 4.1.1

Ultimate Boot CD (UBCD) is a free Linux-based tool you can use when your Windows PC simply refuses to boot from the hard drive. Just burn it to a CD, pop it in your CD/DVD drive, make sure your Bios is configured to allow booting from CD-Rom and turn on your PC. You'll boot into a text-based menu that offers dozens of handy system utilities to help you diagnose and repair your PC, plus you can even use it to recover files from NTFS-formatted hard disks. You can even configure UBCD to boot from a USB memory key, by following the script included.

BROWSERS, MANAGERS AND EXTENSIONS

Not so long ago, most people used a standalone web browser such as Netscape but since the inclusion of Internet Explorer with Windows, many of us use this as our default browser. Compared to Mozilla Firefox or Opera, though, Internet Explorer's features are updated irregularly, apart from the occasional security update.

Firefox 3 beta 3

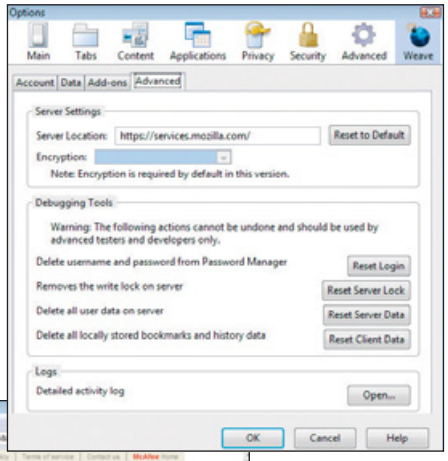
Although we've also included Firefox 2 on the disc, we've decided to encourage you to give Firefox 3 beta 3 a try as it's now a very stable web browser with a brand-new, and fast, graphics engine and a superb bookmarks manager.

Mozilla Firefox is a free web browser developed by a group of enthusiasts dedicated to developing new features, releasing security updates and extensions for the very popular browser.

Firefox is arguably the most popular web browser after Internet Explorer. And, unlike Microsoft's browser, you don't have to wait more than a couple of months before a new version is released.

Why choose Firefox over Internet Explorer? One key reason is the wealth of extensions and add-ons that have been made available by other web developers.

Firefox 3 is the latest version of Mozilla's browser



Access your bookmarks everywhere with Mozilla Weave

Site Advisor warns you of scam and fake websites

There are extensions for everything from locating an address via Google Earth to synchronising your bookmarks across different versions of Mozilla Firefox, whether installed on Windows, Mac or Linux. That's another reason to choose Firefox – if you're a Mac user, the browser operates in the same manner as you'd find in Windows. It's the same rendering engine, the same bookmarks manager and the same user interface.

Mozilla Weave

If you spend a lot of time updating your bookmarks, you'll probably want access to the same information across all the computers you use, whether at work or home. Take a laptop on the road, and you'll be lost without your favourite bookmarks. Move across to another computer, and the first thing you'll want to do is make sure the bookmarks list includes the sites you use regularly.

The snag is, how do you manually make sure your bookmarks are the same across every edition of Firefox? For the current release of Firefox 2, Google launched an extension called Google Browser Sync for Firefox. With this, you can set up an account on Google and use its server to back up your bookmarks. Install the extension on another computer and the first thing it will do is check your Google account to download your bookmarks.

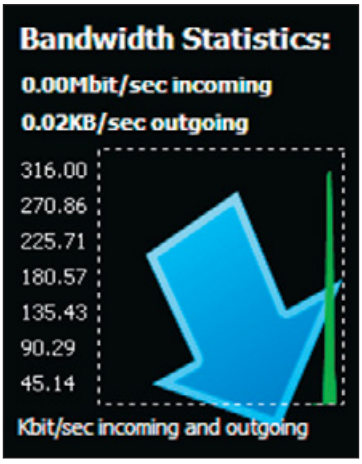
Mozilla Weave is an official Firefox 3 extension, from the same team who produced the web browser. You set up your own Mozilla account and then install Weave on each computer on which you've installed Firefox 3, whatever the operating system. Make a change to your bookmarks on one of the systems and you'll find that they are automatically updated on the others.

Future revisions of this extension will enable you to share your bookmarks (or some of them) with your friends and family.

Orbit Downloader 2.6.1

Even with the fastest broadband connection, downloading large files can be problematic. Your internet connection depends on a number of factors and some of these include the speed of the server that is sending you the files, the number of users connected to it and even the time of day.

We often receive support queries from users who have downloaded a Zip archive to find the file is corrupt and can't be ↘



Keep an eye on your internet network use with Bandwidth Monitor

opened. Often, that's down to it being incomplete – it may have stopped while you left your computer to make a cup of tea.

It's not always easy for the average user to know if a file has downloaded entirely, and most web browsers only allow you to download a file again from scratch, rather than resume from where it stopped.

To overcome this sort of problem, you need a download manager, and the one we recommend is Orbit Downloader. It's free and enables you to source downloads from multiple locations, thus speeding up your access to the file. If a file stops downloading, you can resume from the previous location, so if it has downloaded 70MB of the original 100MB, you'll only need to download the remaining 30MB.

Orbit Downloader integrates with your web browser and will automatically take control over downloads for you.

McAfee Site Advisor

There are many rogues who spend time trying to develop sites that are designed to look just like your favourite online auction house or your bank. If you fall victim to these, you could hand over all the information someone needs to log in to your online bank account and transfer money, open another account in your name and more.

McAfee Site Advisor is a free browser extension that will enable you to obtain information about the websites you visit. This information is displayed, traffic light-style, with a red warning indicating a suspect web address, amber warning of possible problems or green if the site is both safe and rated as a respected website by other users.

If you want more information about the site, you can visit **www.siteadvisor.com** for a more extensive report, including notes and comments from other visitors.

INTERNET AND NETWORKING TOOLS

Devicescape 2

Take your laptop on the road and you can spend a lot of time trying to find a legitimate Wifi network to connect to. If you've spent time at a major station, you'll soon realise there are a number of commercial, free and often decidedly ropey Wifi networks that are accessible to anyone. However, Wifi access isn't always secure and it's quite easy to eavesdrop on an unsuspecting user. Connect to a free Wifi network and, although most of your work is likely to be safe, any files or messages you send across it are open to interception. Type personal information into your web browser and you don't know who may be able to access it.

Devicescape is a free tool for Windows that will enable you to automatically log in to predefined Wifi networks. You can choose the networks that you wish to monitor and then add your username, password and other information to Devicescape, which can then automatically connect you when you're within range of a wireless network, and you'll be reassured that your system will only connect to the wireless networks of your choice.

Devicescape is also available for mobile devices and can be rather effective. One thing to watch out for is that you may find that you're connected to a wireless network without realising and, if your network charges by the amount of time for which you're connected, you should turn off the auto-connect option to avoid running up your bill.

Bandwidth Monitor Lite 2

Using the internet can be rather frustrating. Some broadband providers say they offer a 24Mbits/sec service but, in most circumstances – unless you've connected at 4am in the morning – you'll be sharing capacity with other internet users on your local exchange and in the ISP's network. If your broadband provider has limited capacity, you may find that downloads quickly reach a plateau, and your connection seems no faster than dial-up access.

One option is to move to an ISP than can guarantee throughput, but restricts the amount of data you can download from the internet. This is called a cap and is often based on your monthly charge. For example, with BT Internet there's an 8GB per month cap, depending on your choice of package. Some providers cut you off or slow you down when you exceed the cap, while others charge you more.

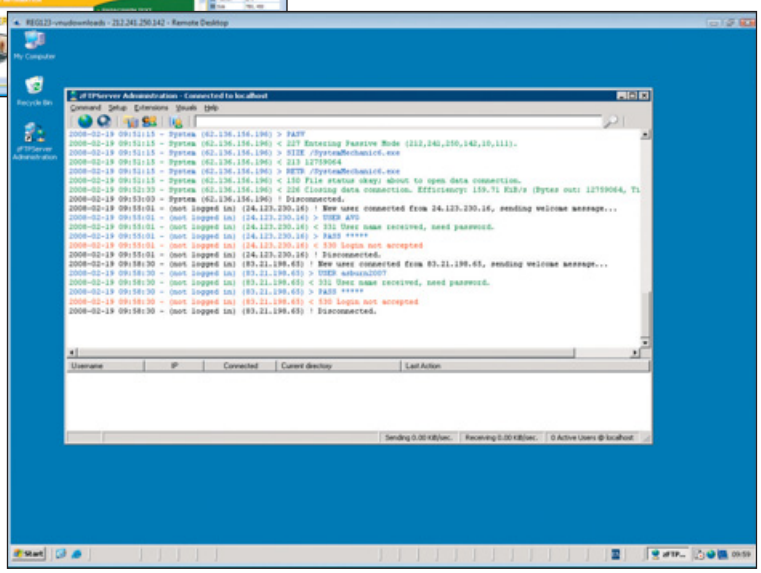
Bandwidth Monitor Lite 2 is a free tool that you can use to monitor your current connection to make sure it doesn't go beyond the cap, or keep an eye on the bills if you do.

Wysiwyg Web Builder 5

If you've been given free web space with your broadband connection, creating a homepage can be an easy way to share photos, digital media and downloads with your friends and family. If you're experienced, you could even set up a secure area on your site so that only authorised users download certain files.

If you're not experienced, though, even designing the initial pages, creating the structure of a website and getting the pages

Above: Wysiwyg Web Builder makes site creation easy



Right: Set up an FTP server in moments with FTP

online can be tricky. Even for advanced users, it can sometimes be far from straightforward and the details can differ depending on whether your web server is based on a Windows or Linux platform. Wysiwyg Web Builder 5 is trial software which can be used to quickly design and build the pages you require for your site. You don't need to understand how web pages are put together, as you simply drop in the photos, text and other elements to make the pages. Once you've finished your site, you can automatically upload it to your web space and test it online.

ZFTP Server 3

Strange as it may seem, just about anyone can run a web or FTP server. In fact, it's probably easier to set up your own server than to build a website.

The market for servers is pretty competitive, and nowadays you can rent a server for as little as £25 per month. Some even come with unlimited bandwidth, so you can host plenty of files without worrying about, extra costs or paying a huge bill at the end of the month.

Setting up an FTP server is the easiest way of providing files to other users, and if you have a fast broadband connection, you could do it on your own computer, allowing people to access it via a domain through a dynamic service, such as **www.dyndns.org**.

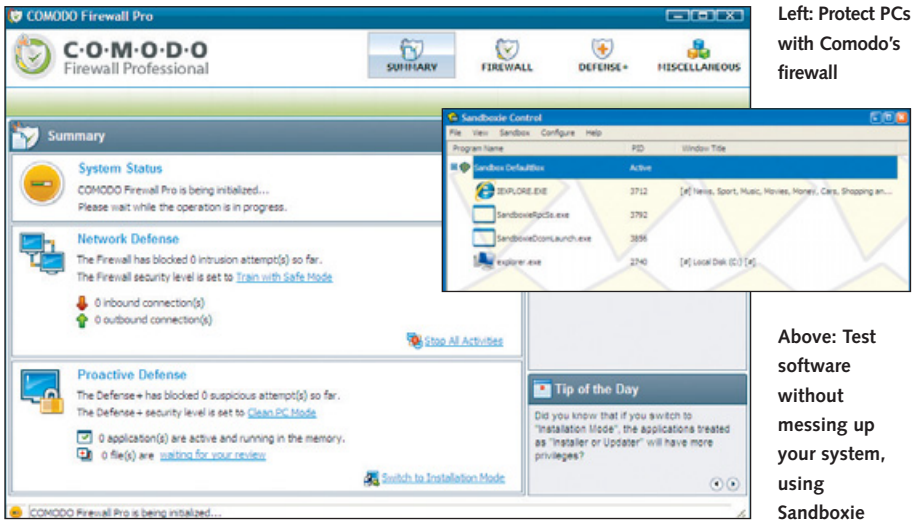
ZFTP Server 3 is one of the best free FTP servers. It's easy to install and will enable you to set up both public and private areas for other users to access files, either on your computer or a remote server. If you use a remote desktop tool, you can see who is connected to your FTP server and configure accounts, monitor usage, statistics and even kick users from the site if they're hogging bandwidth.

SECURITY

These days, with stories of massive bot-nets and viruses, many of us are rightly concerned about the security of our PCs. When we leave PCs sitting there, hooked up to an always-on broadband link, is it safe? Can other net users scan your PC to see if they can gain access? Is there malicious software ready to be triggered? Will spyware be sending your personal information to someone else while you access your online account? Fortunately, we've provided a range of tools on the disc to make sure you can go online without worrying about these threats.

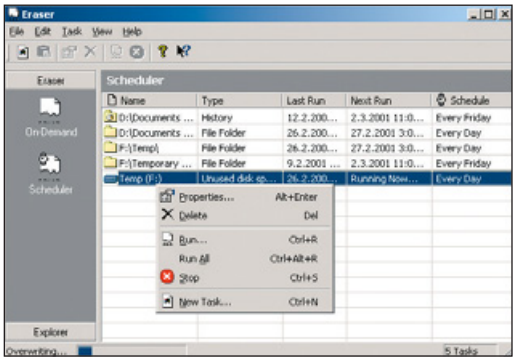
Comodo Firewall Pro 3

If you have a broadband connection, your router probably includes a hardware-based firewall and, broadly speaking, that's safer than a software-based one. However, very often you might have more complex needs, for example a system that works as a file server and a laptop that's also used outside the home will each require different firewall settings and levels of protection to balance ease of use against security. Comodo Firewall Pro 3 is a free personal firewall that you can use across multiple computers on a network.



Left: Protect PCs with Comodo's firewall

Above: Test software without messing up your system, using Sandboxie



Make sure data is wiped properly with Eraser

Eraser 5.86

When you drag files to the Recycle Bin in Windows, you can always drag them back. And even when you've emptied the trash, the files haven't necessarily been removed from your system. In fact, many of them are still recoverable – a potential security risk if you sell or pass on your PC to someone else. It happens because when you delete a file Windows simply makes a note that the space can be re-used later – and if it's not, your data, or parts of it, can be recovered. The answer is to wipe the files from your system entirely, by writing over the space that they used to use. Although most internet security suites now include a tool to securely erase your important files, many users prefer to mix and match their system utilities. Eraser is a free tool that performs one function: it will securely wipe files, data and other information from your computer. Once you've used Eraser on them, you won't be able to retrieve or recover the data.

Sandboxie 3.22

One of the problems with Windows is that each time you install software, there's a danger that it might change some of your system settings – for example, forcing particular types of file to open in the new application. If you just want to test a program, that sort of thing – let alone the potential security issues – can be annoying. And using a full-blown virtual machine is a lot of effort for many users. One answer is to install and test your software within a safe and secure environment that can't affect the rest of your PC – known as a sandbox. Sandboxie is a free tool that does just that, so you can use it to test software, without worrying about configuration or security changes being made to your PC. It will also enable you to install and test games, without having to store game information on your system.

Keepass 2.04

Though they're essential for security, passwords can also be a nuisance, especially when you have to remember different ones for online banks, forums or other sites. You don't want to risk security by using the same one on each site, but you don't want to spend ages trying to remember the right one for each web page you visit – and then requesting a new one after you've failed to log in correctly. The answer is a password manager – software that stores multiple passwords and then fills in the details on each website correctly. Each site can have a password of its own, and all you'll have to remember is a single password to access the password manager. Keepass is free and integrates into your web browser, enabling instant access to sites that require password entry.

See over for a listing of the free programs.

LINK: GET MORE FREE DOWNLOADS!
Visit www.pcw.co.uk/downloads

AUDIO, VIDEO AND PHOTO		
Audacity 1.3.4*	http://audacity.sourceforge.net	Record and edit audio files, then export them as WAV, AIFF, MP3, and OGG
GB-PVR 1.1.5*	www.gbpvr.com	Schedule TV recordings, and view and pause live TV with a tuner card
K-Lite Mega Codec Pack 3.7.5*	www.codecguide.com	A collection of useful codecs for encoding and playing back audio and video files
Mediacoder 0.6.0.3990*	http://mediacoder.sourceforge.net	Universal batch transcoder for converting files between audio or video formats
Paint.net 3.22*	www.getpaint.net	Image and photo manipulation software
Screenshot Captor 2.37.03*	www.donationcoder.com	Capture active windows, selected regions, fixed regions, or the entire desktop
Songbird 0.4*	www.songbirdnest.com	Media browser and music player built on Firefox's browser engine
Studioline Photo Basic 3.50.18*	www.studioline.biz	Superb image and photo-management application
VideoDVDMaker Free 3.6*	www.protectedsoft.com	Flexible, easy-to-use DVD maker lets you create your own DVD movies quickly
Videospin 1.1*	http://videospin.com	Create films using videos and pictures and export them to your home page
Wavosaur 1.0.1.0*	www.wavosaur.com	Audio editor, ideal for editing audio clips, sound designing, mastering and more
Picasa 2.7 Build 37.32*	www.picasa.com	Transfer pictures from a digital camera, organise on a hard disk and edit them
BACKUP AND RESTORE		
Acronis True Image 11††	www.acronis.com	Disk imaging tool that lets you create a backup image of your entire hard disk
Bart's PE Builder 3.1.10*	www.nu2.nu	Create a bootable CD or DVD from the XP/Windows Server 2003 installation CD
Cobian Backup 8.4*	www.educ.umu.se/~cobian/cobianbackup.htm	Back up your files and folders in original or compressed form
Erunt 1.1j*	www.larshederer.homepage.t-online.de/erunt	Registry backup tool for use before installing and testing programs on your PC
HDClone Free 3.2*	www.miray.de	Transfer your data and settings to a new PC, or make a complete drive backup
Paragon Drive Backup 8.5 SE†	www.paragon-software.com	Create scheduled backups of your most important files with ease
PC Tools File Recover 6.2†	www.pctools.com	Find and recover lost files and fragments of data stored on your hard drive
Spybot Boot CD 1.03*	www.safer-networking.org	Create a bootable secure recovery CD
Syncback 3.2.18††	www.2brightsparks.com	Synchronise important files across computers, online or via a USB memory key
Synctoy v2.0 Beta*	www.microsoft.com	Advanced folder synchronisation tool
System Rescue CD 0.4.3*	www.sysresccd.org	Linux on a bootable CD, with tools for system repair and recovery
Ultimate Boot CD 4.1.1*	www.ultimatebootcd.com	Bootable CD with a range of diagnostic, repair and system enhancement tools
BROWSERS, MANAGERS AND EXTENSIONS		
Maxthon 2.0.8.1720*	www.maxthon.com	A popular and regularly updated replacement for Internet Explorer
Mozilla Firefox 2.0.0.12*	www.mozilla.com	Probably the most popular alternative web browser. Flexible, powerful and stable
Mozilla Firefox 3.0 beta 3*	www.mozilla.com	A public preview of the next major release of Mozilla's web browser
Netscape Navigator 9.0.0.5*	http://browser.netscape.com	The latest – and last – version of Netscape's alternative browser
Opera 9.25*	www.opera.com	A fast, reliable web browser, Opera is popular and very flexible too
Orbit Downloader 2.6.1*	www.orbitdownloader.com	Easy-to-use free download manager
All in one Sidebar 0.7.3*	www.firefox.exxile.net	An add-on for Firefox that makes it easy to verify the authenticity of a website
Allpeers 0.75.1*	www.allpeers.com	Whenever you use Firefox, use this peer network to share your files
Cookieswap 0.5*	www.cookieswap.mozdev.org	Cookie manager for Firefox that lets you set up multiple users with one browser
Fancy Numbered Tabs 1.1*	www.hasonetoomany.com	A plug-in that enhances tabbed browsing in Firefox
Firefox Backup Extension 5.3*	www.customsoftwareconsult.com	Back up Firefox settings, including themes, preferences, bookmarks and more
Firefox Showcase 0.9.4.6*	www.showcase.uworks.net	Manage your Firefox tabs and windows by viewing them as thumbnails
Flashgot 0.7.2*	www.flashgot.net	Firefox extension to handle downloads. Support for external download managers
Foxmarks 2.0.43*	www.foxmarks.com	Access your bookmarks from any machine, via foxmarks.com
Gmail Notifier 1.6.1.1*	www.google.com	Simple application that alerts you when you have new Google Mail messages
Google Toolbar 3.02*	www.google.com	Instant access to a variety of Google services via your browser's toolbar
IE Tab 1.3.3*	www.ietab.mozdev.org	View pages that require Internet Explorer, without leaving Firefox
Jiwire Hotspot Helper 2.2*	www.jiwire.com	Find hotspots easily, from the Windows Taskbar
McAfee Site Advisor 26.3*	www.mcafee.com	Add instant security alerts to your browser, for warnings about scam websites
Morning Coffee 1.26*	http://addons.mozilla.org/firefox/addon/2677	Firefox plug-in that highlights different web pages on particular days
Mozilla Weave 0.1.16*	http://labs.mozilla.com	Synchronise bookmarks across computers, with Firefox 3
Personas 0.9.2*	http://labs.mozilla.com	Change the appearance of your web browser
Scribefire 1.4*	www.scribefire.com	Blog directly from Firefox, whatever site you're viewing
Web Developer Toolbar 1.14*	www.chrispederick.com	Web developer tool – see the effect of CSS and other page changes instantly
BURNING AND MEDIA		
Burnaware Free Edition 1.2.5*	www.glorylogic.com	Burn your data and audio discs with minimum hassle
Imgburn 2.4*	www.imgburn.com	Create and manage ISO images, or burn them to disc
CDBurner XP Pro 3.5.101.6*	www.cdburnerxp.se	Burn any kind of disc, from CD through to Blu-ray
Finalburner 1.19.0.102*	www.protectedsoft.com	This small application enables you to create almost any disc format
Libra 0.9.2*	www.getlibra.com	Create a library to organise your books, audio CDs, movies and video games
Romeo Burner Lite 2.3*	www.romeoburner.com	A simple yet powerful CD burning application
BUSINESS AND OFFICE		
Chandler 0.7.2*	www.chandlerproject.org	Personal information manager (PIM)
DoPDF 5.3.250*	www.dopdf.com	Free PDF converter for both personal and commercial use
EssentialPIM Free 2.2*	www.essentialpim.com	Multilingual information manager. Includes calendar and contact manager
Lotus Symphony beta 4*	http://symphony.lotus.com	Free office suite that supports Open Document Format and Office documents
Openoffice 2.3.1*	www.openoffice.org	Word processor, spreadsheet, database and presentation graphics program
T5otal Organizer 2.21*	www.konradp.com	Manage small office projects and tasks
Microsoft Malicious Removal Tool 1.38*	www.microsoft.com	Scan your PC for malicious software

DEVELOPER AND WEB DEVELOPMENT		
Aptana Studio Community 1.0*	www.aptana.com	Coding tool designed for developers who want to program using HTML, CSS or Javascript
Free CSS Toolbox 1.01*	www.blumentals.net	Edit existing CSS style sheets and code
Inno Setup 5.2.2*	www.jrsoftware.org	Create Windows installation packages for your files
Instant Update 1.0 RC2*	www.wyday.com	Enables software developers to add an auto-update facility
Style Master 4†	www.westciv.com	Professional CSS editor for web designers
Twistpad 1.62*	www.carthagosoft.net	Coding tool that's used as a Notepad replacement, or an enhanced editor for web developers
GENERAL UTILITIES		
7-Zip 4.57*	www.7-zip.org	File archiver with a high compression ratio and support for many different formats
Adobe Reader 8.1.2*	www.adobe.com	View and print Adobe Portable Document Format (PDF) files
Directory Opus 9.1.0.2††	www.dopus.com	A file browser designed to replace Windows Explorer
Java Runtime Environment v6 r4*	http://java.sun.com	Java virtual machine, runtime class libraries, and Java application launcher
Microsoft .Net Framework 3.5*	www.microsoft.com	The .Net Framework is needed to run many applications
Renamer 5.2*	www.redbrick.dcu.ie/~den4b	A flexible file renaming tool with a wide range of options
INTERNET AND NETWORKING TOOLS		
Bandwidth Monitor Lite 2.0.121*	www.rokario.com	Monitor your bandwith usage and view statistics
Filezilla 3.0.5*	http://filezilla-project.org	Download files from the internet using FTP and auto-resume
Free Download Manager 2.5.737*	www.freedownloadmanager.org	Download accelerator and manager which can even grab an entire website
Gizmo Project 4.0.0.319*	www.gizmoproject.com	Make calls to other computers via broadband. Any call to another Gizmo Project user is free
Mozilla Thunderbird 2.0.0.9*	www.mozilla.com	Popular email client that has a small footprint and some smart ways to stop junk mail
Skype 3.6.0.244*	www.skype.com	Make cheap calls over the internet. Use Skype to start a group conversation between friends
SmartFTP 2.5.1006.6**	www.smartftp.com	Advanced FTP client – can be used to sync files between a computer and a remote server
ZFTP Server 3**	http://zftpserver.serveftp.com	Comprehensive, free FTP server that lets you set up secure access to your files
Wysiwyg Web Builder 5††	www.wysiwygwebbuilder.com	Templates for designing, building and uploading a website
Devicescape 2*	www.devicescape.com	Auto-connect to networks and hotspots according to your preferences
Hamachi 1.0.2.5*	www.hamachi.cc	A simple-to-configure Virtual Private Networking (VPN) application
Siteup 1.1*	www.xequte.com	Simple site checking tool that will enable you to monitor websites to check their status
OPTIMISATION AND DIAGNOSTICS		
Antifreeze 1.0*	www.resplendence.com	A quick-launch task manager, to help you avoid system lock-ups
Auslogics Disk Defrag 1.4.11.275*	www.auslogics.com	Speed up your PC by defragmenting your hard drive
Auslogics Registry Defrag 4.1.6.75*	www.auslogics.com	Scan through the Registry to reclaim wasted space and reduce its size
Autoruns 9.12*	www.sysinternals.com	Manage start-up items quickly and easily
CCleaner 2.04.543*	www.ccleaner.com	Cleanse your system of unused and unnecessary files
Defraggler 1.00.031*	www.defraggler.com	A compact defragmenting tool that works on a selection of files, as well as your entire drive
Eusing Free Registry Cleaner 1.6*	www.eusing.com	Scan your Windows Registry for invalid or obsolete information
Recuva 1.10.223*	www.recuva.com	Recover files that you've accidentally deleted
TweakVI Basic 1.0.1075*	www.totalidea.com	Tweak and optimise your internet connection
Updatestar 1.2*	www.updatestar.com	Search for and download updates to your installed applications
VLite 1.1.1*	www.vlite.net	Remove unwanted components from Vista or build a Vista lite install DVD
PORTABLE APPLICATIONS		
7-Zip Portable 4.57*	www.7-zip.org	Work with compressed 7z, ZIP, GZIP, BZIP2, TAR, RAR files on the go
Audacity Portable 1.2.6*	http://audacity.sourceforge.net	Portable version of the popular audio editor
Firefox Portable 2.0.0.12*	http://portableapps.com	Mozilla Firefox Portable edition is a transportable version of the popular web browser
Keepass 1.10*	http://keepass.sourceforge.net	Portable version of the password manager
Openoffice Portable 2.31*	http://portableapps.com	Office application suite with word processor, spreadsheet and presentation graphics program
Opera 9.25 USB Edition*	http://opera-usb.com	Portable version of Opera which leaves no traces of your internet session on the computer
Photofiltre Portable 2.0*	http://photofiltre.free.fr	An image and photo editor that will enable you to touch up digital photos on your laptop
Portable Bookmarks 2.1*	www.portable-bookmarks.com	Store bookmarks on any removable device, such as a USB key
Portable Start Menu 1.2*	www.aignes.com	Launch applications from a USB stick or external drive
Roboform2Go 6.9.87*	www.roboform.com	Generate passwords, store form information and create identities for general form-filling
Thunderbird Portable 2.0.0.9*	http://portableapps.com	Safe, fast email client that's easy to use
VLC Media Player Portable 0.8.6*	www.videolan.org	Portable multimedia player with support for MPEG1, MPEG2, MPEG4, DivX, MP3, and OGG
SECURITY		
Ad-Aware 2007 Free 7.0.2.6*	www.lavasoftusa.com	Identify and remove any adware or spyware components on your PC
Comodo Firewall Pro 3.0.15.277*	www.personalfirewall.comodo.com	Secure your system against malicious software and external attacks by hackers
Eraser 5.86*	www.heidi.ie	Permanently erase sensitive data from your hard drive
Keepass 2.04*	http://keepass.sourceforge.net	Store and manage multiple passwords easily
PC Tools Antivirus 4.0.0.20**	www.pctools.com	Protect your PC from viruses
PC Tools Firewall Plus 3*	www.pctools.com	Powerful but easy-to-configure firewall software
Sandboxie 3.22**	www.sandboxie.com	Test software in a secure environment without affecting the rest of your PC
Spybot Search and Destroy 1.5.2*	www.safer-networking.org	Popular anti-spyware application
Webroot Spy Sweeper 5.5.7.124††	www.webroot.com	Popular anti-spyware application
Webroot Desktop Firewall 5.5.10.20**	www.webroot.com	Free, high-quality firewall application
Ashampoo Antivirus 1.6*	www.pctools.com	Free anti-virus software
Microsoft Malicious Removal Tool 1.38*	www.microsoft.com	Scan your PC for malicious software

Licence key: * = freeware, ** = free for personal use, † = full software, †† = trial software

Speed up your PC

Don't resign yourself to poor performance. With a little know-how you can breathe new life into your PC, as Tim Nott explains

You'd be surprised if your new car couldn't do more than 50mph after a few months, or if your new dishwasher took all day to wash a few plates, and you'd probably be complaining loudly to the supplier. However, we take it as read that personal computers have some sort of built-in entropy or sloth accumulator, and that they slow down over time. Unlike cars or appliances, complaining won't get you very far. But this feature will. We've compiled a list of steps you can take to restore the pristine performance of your PC.

With two exceptions, we won't be looking at hardware purchases, and where possible we'll be considering free or cheap software to maximise your PC's potential. Above all we'll be looking at ways you can tweak Windows Vista and XP yourself.

Unless otherwise stated, all the software mentioned in this feature can be found at **www.pcw.co.uk/downloads**. Finally, to avoid repeating ourselves, all references to Vista's Control Panel refer to the Classic View, which you enable by clicking on 'Classic View' from Control Panel Home.

Hardware updates

If you could do one physical favour to your PC, it would probably be to install more memory. In a worst-case scenario, where you have to discard the existing memory modules, an upgrade to 2GB can be bought for well under £100 for a desktop PC. Although all versions of Vista will run, or perhaps more accurately, jog in 512MB of Ram, if you want the full benefits of Vista including Superfetch and the Aero interface, then 2GB is desirable. XP can also benefit from a memory boost. Although it will run in as little as 128MB, 512MB should be considered a more realistic figure. In either version, if you are using memory-intensive applications, such as editing large image, sound or video files, more is better. 32-bit versions of both XP and Vista will address up to 4GB (but see **www.pcw.co.uk/2202273** to find out how devices can use up some of your available memory).

Disk hygiene

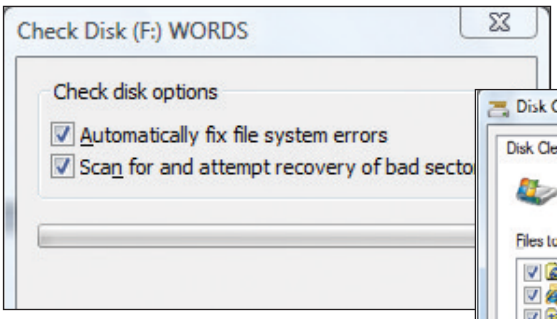
Junk files on your PC don't just waste valuable disk space: they slow down performance, especially on a disk that's nearly full. On an ideal hard disk, every file would occupy its own physically contiguous sector. In practice, this state of affairs rarely, if ever, occurs – most files are 'fragmented', so that the read/write head of the disk has to dash back and forth reading different sectors to load a file into memory. Similarly, if disk writes have to seek out multiple small free spaces to store a file, performance drops.

Disk optimisation is a three-stage process. First you need to check each drive for errors. The procedure is the same in XP and Vista – right-click on the drive you want to check, choose Properties, turn to the Tools tab and click the 'Check now' button. Make sure at least the first option (Automatically fix...) is checked or nothing will be repaired. Click the Start button and you will most probably be presented with a dialogue explaining that Windows can't check the disk while it's in use, so click the Schedule disk check button to perform the check on the next reboot. The check may take some time, so wait until you take a break before restarting.

Next, perform a disk clean-up. Vista users can once again find this in Performance Information and Tools, while XP users will find it under System Tools in the Start menu.

Look out for the pitfalls of registry cleaning

Some tune-up or Registry cleaning programs offer a free scan, but then ask you to pay for the software to have the problems fixed. Although this is a hard-sell approach, there's nothing underhand about it. The same cannot be said for all self-styled 'cleaners'. Notoriously, a program named Registry Cleaner 2.5, advertising itself as from a 'Microsoft Certified Partner' detects a Trojan (ctpmon.exe) that was used to install it. So beware of anything that pops up unexpectedly offering to fix problems on your PC, and run anti-malware software regularly.



Above: Check your drive for errors

In either case you are prompted to choose a drive and you'll be presented with a list of what can be cleaned up, such as Temporary files, old Restore points and 'lost chains' recovered by disk checking. Vista has a few more options, such as Dump files, Error report files and cleaning the Hibernation file.

Having cleaned up your drive or drives, you should defragment them. Again this is available from the XP or Vista Start Menu, Accessories, System Tools, or from the Tools tab of any drive properties. Both XP and Vista let you check the drive state before defragging, and Vista lets you schedule regular defrags.

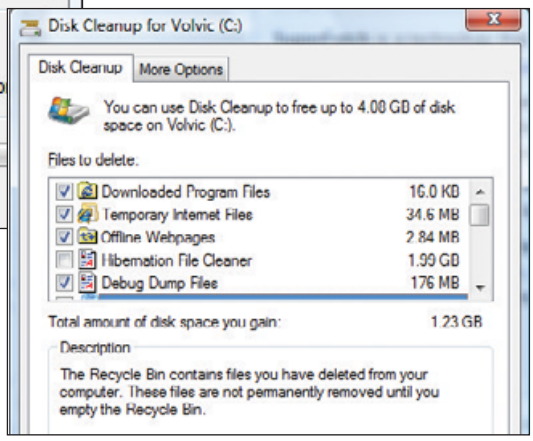
Paging file

Volumes have been written on the Windows paging (or swap) file and how to optimise it, but we're going to keep things brief. In both Vista and XP you can find the settings in System Properties, Advanced. Click the Settings button in the performance section. Then go to the Advanced tab, then Virtual memory, Change. By far the best strategy is to let Windows manage the swap file. Vista will do this for all drives. If you do want to make any changes, check first that the drive on which you want to create a paging file has plenty of room and is defragmented.

Startup tips

A lot of software creators think it necessary to add startup items and System tray icons. At worst they can slow down startup time, 'phone home' and generate unwelcome pop-up messages. If you Start, Run, Msconfig.exe, you'll find a Startup tab that lists all these items, the executables that are run, and the folder or Registry key that runs them. If you clear the checkbox beside an item it will no longer load, but it will stay in the list so you can re-enable it. We don't advise disabling your anti-virus software, but many other startups can be disabled without any ill effects. We found on a test PC with 26 startup items, that disabling 22 inessential items slashed the time it took to log on from 80 to 40 seconds. We've compiled a list of commonly found startup items, together with their 'owners' and their usefulness in the table on the next page. Vista users can also manage startup programs from Control Panel, Performance Information and Tools. Advanced users can find a more comprehensive startup controller – Autoruns 9.11 for Windows by Sysinternals – at *PCW* downloads (**www.pcw.co.uk/downloads**).

Below: There are various additional Vista clean-up options



Sleep or hibernate

There are other ways of speeding up Windows Startup. If you put your XP PC into Standby, it will go into a low-power state, turning off hard disks and the monitor but retaining the current state of Windows and applications in memory. When you press a key, Windows will resume in a fraction of the normal boot time. You can opt either to return to the Welcome screen or your desktop – in either case the latter will be as you left it. The disadvantages of this are that your are still consuming energy and, should the power fail, you may lose unsaved data. XP's Hibernate saves the current state of the PC to disk before shutting down the PC completely. It still has to reboot but it will save re-opening all the programs, files and folders you were using.

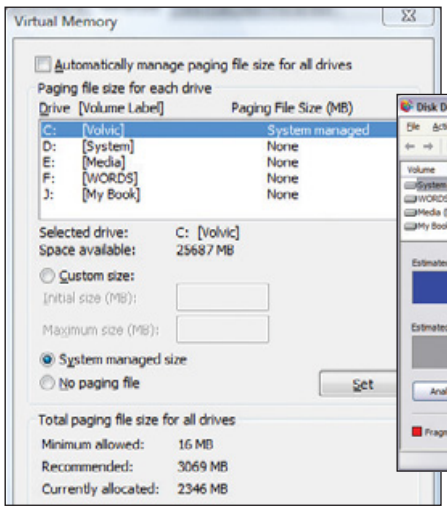
Vista does things slightly differently, with two standby or sleep modes. Normal sleep is primarily designed for laptops. It's similar to XP sleep except that should the battery level fall below a safe level, the contents of the memory are saved to disk – just as with Hibernate. Hybrid sleep mode is for desktop PCs and works the opposite way round – it first saves memory to disk, in the same way as Hibernation, and then goes into Standby. This way, you won't lose data with a power failure, but you'll still get the normal fast return. To enable this, open the Power Options, and with any power plan selected, click 'Change Plan Settings'. In the next dialogue, click 'Change Advanced Power Settings'. In the next dialogue, expand the Sleep entry and the Allow hybrid sleep entry.

If you use Standby or Hibernate regularly, it's a good idea to close down Windows and restart normally every so often. This will flush the system, clear up memory leaks and close processes that may not be needed.

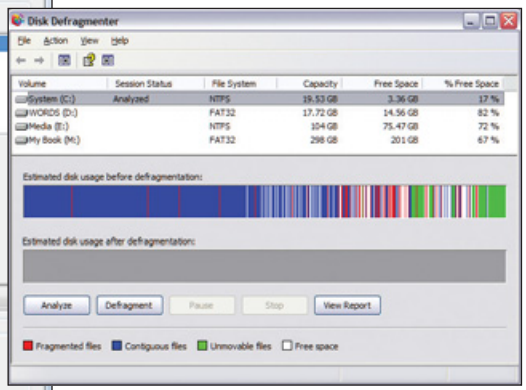
Superfetch and Readyboost

Prefetch was introduced in Windows XP, and boosts the loading of both the operating system and applications, by monitoring and mapping what files are accessed. Contrary to folklore, it is not necessary to periodically empty the prefetch folder or tweak its Registry settings. Vista improves on this in two ways – Superfetch factors in the time and frequency of access, second-guessing what the user may be about to do. Readyboost intercepts data being sent to the paging file, redirecting it to a Flash drive.

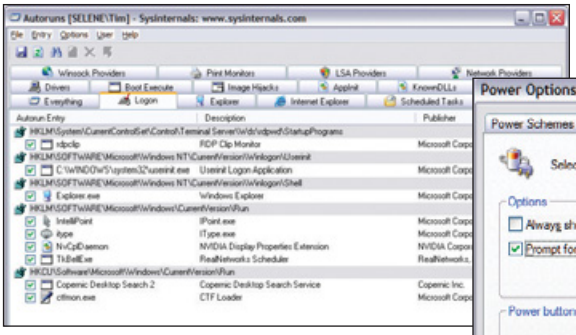
If you have a suitable USB Flash drive, plug it in and when the Autoplay dialogue appears you should see an option to 'Speed up my system'. If Autoplay doesn't appear, then right-click on the device in Explorer and choose Properties. Turn to the Readyboost tab, select the 'Use this device' option, then move the slider to the amount of space you want to use. Vista needs a minimum of



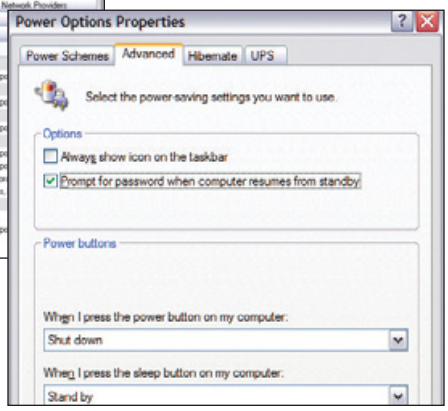
Left: Let Windows manage the paging file



Above: Preparing to defragment



Above: Startup management for uber-geeks



Below: Clear the password box to go straight to your Desktop

256MB of fast Flash memory, so not all devices will be eligible. Microsoft recommends between one and three times the amount of Ram you have installed on the system, with a maximum of 4GB. So with 4GB and even 8GB USB Flash drives available for less than £30 this could be a cheap boost, and you can still use part of the drive for normal storage. Just make sure the drive is compatible with Readyboost before buying.

Less wow, more speed

XP and Vista both have performance settings under System Properties, Advanced, where you'll find a Settings button in the Performance section. On the Visual Effects tab you have various options. You can adjust for best appearance, best performance, let Windows choose, or customise each aspect. Unless you have a severely under-specified PC, you'll find that letting Windows choose enables all the visual effects, such as the drop shadows for desktop icon labels and Vista transparency. But there is nothing to lose by experimenting – a little tweaking can make the Start Menu more responsive for instance.

Vista also allows you to turn off other Windows features. In Control Panel, go to Programs and Features, then 'Turn Windows features on or off' in the tasks list. You'll get a list of components that can be enabled or disabled, including Fax and Scan, Games, DFS replication service and so on. Each has a pop-up explanation. You won't delete these items from your disk and can re-enable them from the same dialogue without having to hunt out the Vista installation media. But removed items will no longer run, nor will any dependent services. Although the Tablet PC Optional Components may not look very useful for a desktop PC, it does contain the very useful Snipping Tool, with which we captured all the Vista screenshots for this feature. You will also find the Indexing Service is turned off. Leave it off, as this is not the Vista Search indexer and is only included for compatibility with previous versions of Windows.

Avoid interruptions

Although this doesn't quite fall into the category of pure speed, you may find that avoiding some annoying interruptions speeds up your personal performance. First, if you're the sort of person who never wants to 'Please tell Microsoft about this problem' after an application misbehaves, then you can turn this feature off. In XP, go to System Properties, Advanced, then click the Error Reporting button. You can turn off reporting for Windows, applications or both, with the additional option of still being notified of critical errors. Note that error reporting can be helpful – some users have received feedback to help solve their problem. Vista users need to go to Control Panel, Problem Reports and Solutions, Change Settings where they'll find

Beware malware

Just because you've got an anti-virus package it doesn't mean that your system is free from undesirable software that slows down your PC or generates other annoyances. Spybot Search and Destroy and Lavasoft Adaware both have well-proven reputations and are constantly updated. Running one or both of these regularly is a sensible precaution and essential if you've noticed a recent change in performance.

Startup items top 10

CTFMON	Microsoft Windows (and Office), used for alternative User Input services such as speech, pen and alternative keyboard layouts	Needed – will reinstate itself if disabled from Msconfig
ITUNESHELPER	Apple iTunes	Speeds up iTunes loading and monitors for connected Ipods. Not essential
ITYPE, IPOINT	Microsoft mouse and keyboard software	Needed for customisation and low battery alerts on wireless devices
JUSCHED	Sun Java update checker	You can turn this off and update manually – from Control Panel, Java
MSMSGS	Windows Messenger	Only needed if you want instant messaging available at startup
NVCPL	Adds Nvidia-specific tabs to Display Properties	Needed – will reinstate itself if disabled from Msconfig
PICASAMEDIADETECTOR	Puts a Picasa icon in the system tray and alerts you when a USB device or CD containing images is connected	Not needed as Windows has its own detector – disable Picasa from Tools, Options, which will remove it from Msconfig
QTTASK.EXE	Provides an Apple Quicktime launch icon in the System Tray and checks for updates	Not needed. Turn it off from Quicktime Preferences, Advanced
READER_SL	Adobe Acrobat Reader Speed launcher	We noticed little improvement – not needed
REALSCHED	Checks for Real Player updates and messages from Real Networks	Not needed, and many find it a nuisance. Can be disabled from Real Player preferences

more options under Advanced Settings.

Another annoyance is that every time you open a Microsoft Office file, it's scanned for viruses. It can be irritating if you are only opening files that you have created on your own computer. Most virus checkers have a way to turn this off. If you're using AVG Free, then run the Setup.exe program from the AVG program folder. This will give you the option to disable the Office plug-in. If you're using Norton Antivirus, open the Norton Protection Centre and click on Norton Antivirus, then Settings. Under Additional Options, click Virus and Spyware Protection Options, Miscellaneous. Clear the checkbox next to 'Turn on scanning for Microsoft Office Documents'. There is an element of risk here, but with any good anti-virus program you should be able to scan a suspect file on demand, before opening it in Office.

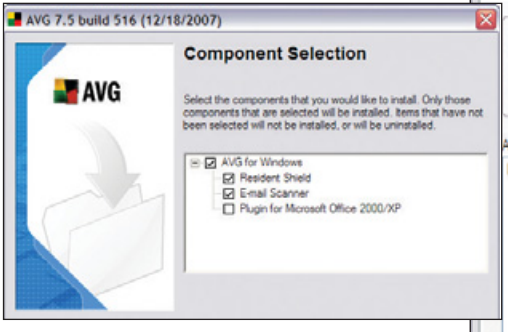
If you're running Vista with administrator status, you've no doubt come across User Account Control (UAC). One way of looking at this is that even if the user has administrative status, the programs that the user is attempting to run may not have. In a worst-case scenario, malware may be attempting to hijack the system. So, typically, when an administrator

'Make sure thumbnails are turned off where you don't need them'

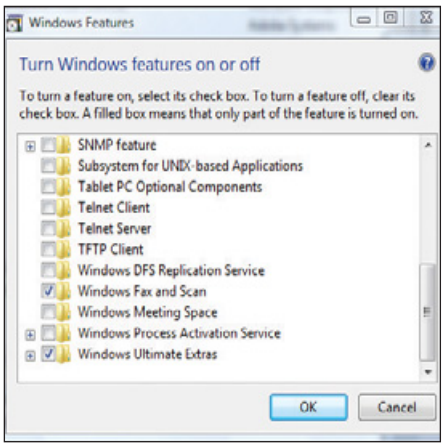
tries to run the System Configuration utility (msconfig.exe) or even a command prompt, the screen will darken and a dialogue appear, stating that 'Windows needs your permission to continue'. In a situation where a large number of users are involved this is undoubtedly useful. But anyone who is just using a PC at home might want to disable UAC. This can be done from Control Panel, User Accounts. The downside is that there is an element of risk and Vista will nag you with security alerts from the System Tray icon.

Manage thumbnails

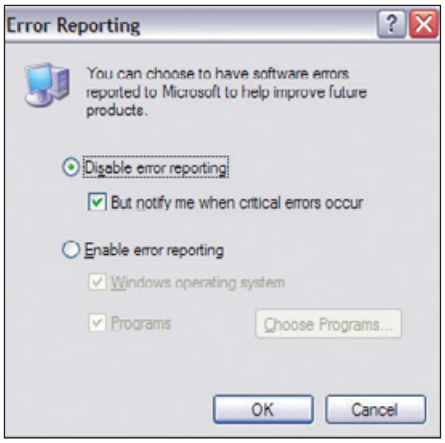
Thumbnails are a good way to view your image files, but of little use otherwise. So



Above: Stop AVG scanning Office on opening



Turn off what you don't need



Sssh! Don't tell Microsoft

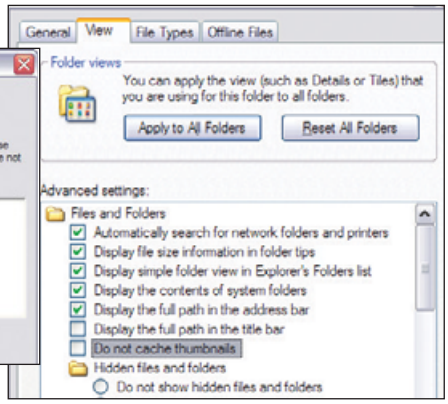
make sure they're not turned on in folders where you don't need them. You might also like to check that you have thumbnail caching enabled. In Windows XP Explorer, go to Tools, Folder Options, View and make sure that 'Do not cache thumbnails' is not ticked. If thumbnails aren't cached, then they need to be regenerated each time a folder is viewed as thumbnails. This takes time and is especially noticeable when 'folder pictures' (showing four sub-thumbnails of the folder contents) is also enabled.

Unlike XP, Vista caches thumbnails centrally, rather than in per-folder thumbs.db files. You can turn off thumbnails completely, from Folder Options, but you can't disable caching. You can clear the thumbnail cache in Vista, but this is only really necessary if thumbnails are damaged.

Registry cleaners

It is often said, especially by the vendors of such software, that regular Registry cleaning is an essential part of PC hygiene. Typically, vendors claim they cure problems that cause crashes, error messages and slow performance. Most will let you download a trial version that will diagnose your Registry problems. You then have to pay for the full product to have the problems fixed. The difficulty lies in judging just what, exactly constitutes a 'problem'. For example, if you

Below: Keep those thumbnails cached



open, save and close a file, then move or delete it, its old location will linger on in a MRU (most recently used) list. Windows keeps such a list for each file type and applications may also maintain their own. Although the existence of the lists themselves may be regarded as a privacy or security issue, only the very obsessive could consider the presence of dead links in these lists to be a problem. We tried several Registry cleaners in the course of researching this feature and these recorded from 333 (PCPitstop) to 2,479 (Registry Easy) 'problems'. One such cleaner with a good reputation is JV16 Power Tools. It offers a fully functional free trial, and each change made can be backed up if desired. All Registry tuning applications should create a backup before making any changes, but we'd recommend making a System Restore point before running the program.

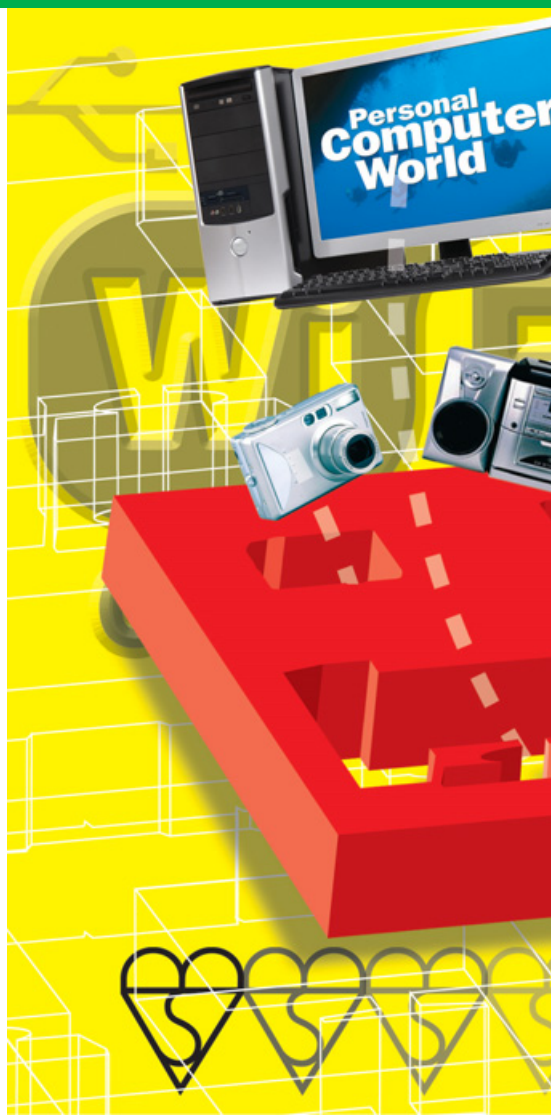
Even if you don't have time to try all the solutions we've shown here, even just a few of them will make a difference to the performance of your PC – and it's certainly better value than just buying a new PC. **PCW**

Indexing ideas

Vista's indexing of file content makes finding files or email messages containing certain words or phrases speedy and efficient. XP users can find similar functionality by downloading Windows Desktop Search or rival products from Google, Copernic and Yahoo. All these work by creating indexes of searchable terms. This is a fairly disk-intensive process, but should only take place when the PC is idle. You can speed up indexing by restricting the folders searched. In Vista this is once again reached via Performance, Information and Tools. Don't run more than one Desktop Search product – they will compete for resources and slow down the system.

Convergence or chaos?

We're all being encouraged to make the most of digital convergence in our homes, but make the wrong choices and you face compatibility nightmares. Nigel Whitfield explains



Sometimes, it seems, you can't move for gadgets designed to let you share content on your home network, with streamers, network-attached storage (Nas) appliances and even mobile phones boasting that they'll let us access our music, data and movies any time, anywhere. The harsh reality is somewhat different. There's a wealth of different standards involved, and even when you have two devices that have the same logos, there's no real guarantee that they'll do what you want.

Take a network with a couple of UPnP (Universal Plug and Play) media players, for example, the Pinnacle Soundbridge, and the Helios X5000, plus a Mac with iTunes, a Nas server with UPnP, and a Nokia N95 phone, which also boasts UPnP support.

Both the Soundbridge and the X5000 can play back music from the Nas server. They can browse music on the N95 too, if it's set up to share it on the home network. But they can't browse the iTunes library on the Mac, unless the Firefly server software is added. And the Nokia phone can browse the network to see files on the Nas device, or the Firefly music server – but it can't actually play anything from them. It can, however, send a stream to be played on the Soundbridge, even allowing you to use the phone's volume control to change the level on the Soundbridge. But it can't do the same trick with the X5000. And all that's before we've added a few more so-called standards into the mix.

Alphabet soup

Standards are supposed to make life easier; and in some areas they do – buy a bit of wireless kit with the Wifi logo on it, that has an 802.11g sticker, and it'll connect to any Wifi network with the same standard. The theory behind UPnP media devices is the same – but just as wireless users can sometimes find that it's the details, such as encryption support, that stop two supposedly compatible devices from working perfectly together, so the world of home networking is full of potential pitfalls.

So, what standards are you likely to come across in your quest for a networked digital home, and what do they all mean? In this article, we'll concentrate on the area of home entertainment and media, and related systems that work with them – we won't go into home automation, for example.

When it comes to devices that serve up or play back content, UPnP and DLNA are acronyms you're going to hear a lot about. Rather than being specifically about media, UPnP is a way for devices to configure themselves automatically (or be configured by another application) on your network; it

'Standards are supposed to make life easier and in some areas they do'

even allows, for example, for a gadget to request that your router open specific firewall ports.

But it's also important in terms of home media because one part of it – UPnP AV – defines types of devices, such as media servers, media controllers and media 'renderers' – playback devices – and how they discover each other on the network. As we saw in our example right at the start though, that's not necessarily enough to make sure everything works together. Although UPnP AV goes far enough to ensure that, in our example, we could send music from our N95 to a Soundbridge music player, there are still gaps.

The Helios X5000 plays music from the Nas server but it can't browse the iTunes library

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Look for DLNA-certified equipment to ensure the best compatibility

And it's those gaps that DLNA – Digital Living Network Alliance (**www.dlna.org**) – bridges. If you are shopping for home media equipment at the moment, and want to be sure of the best compatibility, it's probably the DLNA-certified logo that you should be watching out for. You will even see it on PCs and laptops these days, so it's not just for 'brown' goods.

A DLNA-certified product has to include UPnP support, which takes care of devices being able to find each other on the network,

but in addition, it specifies certain file formats that need to be supported too, and that if a device is trying to send information to another one that doesn't understand the format, it will transcode it. There are requirements – and testing – for interoperability, all of which will help to avoid the sort of issues we talked about earlier.

There are four main types of DLNA device, just as with UPnP AV; Digital Media Servers and Digital Media Players do pretty much what you'd expect. There are also Digital Media Renderers – things like photo frames, wireless speakers or TVs – and Digital Media Controllers, which can control what appears on a renderer; also in the mix are mobile versions, which tend to have slightly different requirements for the formats they should support. And, of course, some devices are more than just one type. A media player TV or set-top box may also be capable of being used as a renderer, allowing you to select a photo on your mobile phone, for example, and send it directly to the TV, rather than having to browse the phone from the TV's remote control.

If you're thinking of buying, the DLNA website has a database of certified products to help you make sure you buy devices that will work together.

Other standards

The DLNA isn't the only game in town, of course. There are some new standards emerging (see the box), and some already here. Microsoft's Windows Media Connect, for example, is also based on UPnP and so will work with a wide range of existing players, but offers better functionality when paired with another WMC device, such as the Xbox 360. It may be tempting to look at

'The DLNA isn't the only game in town. There are new standards emerging'

if you have a new Windows Home Server system and a games console, but beyond the Xbox there aren't many devices that support it fully.

If you use iTunes and its sharing functionality, you'll find that music is shared using a protocol called DAAP (Digital Audio Access Protocol), and the way in which devices discover each other relies, instead of UPnP, on an Apple technology called Bonjour; Airport Express remote speakers use a different protocol too.

Not all MPEG4 formats are the same

When you're looking for media players, you'll usually see a list of the supported formats on the box, or the in-store information cards. And very often you'll see 'MPEG4' listed as one type of video you can play back, alongside MPEG2. But beware – while MPEG2 video, used on DVD, is just one type of compression, the same's not true of MPEG4.

For aficionados of high definition, MPEG4 probably means the H.264 codec used for high-def discs and satellite transmissions – and perhaps, in time, Freeview HD. Also known as the 'Advanced Video Codec' or MPEG4 Part 10, it's becoming increasingly popular as the format supported by both PSPs and iPods.

However, the 3GP format used by some mobile phone cameras, DivX and Xvid are also formats that come under the MPEG4 video umbrella – and those are about the only ones that some media players can manage. If you've spent hours converting video to H.264 format for your iPod, or just want to be future proof, don't simply assume 'MPEG4' means a media player will handle the files; check for 'H.264', 'MPEG4/AVC', or 'MPEG4.10' before you part with your cash.

It's easier than ever to convert video to the H.264 format, MPEG4 Part 10 or AVC, but many 'MPEG4' media players can't play it back

You can now buy broadband routers that include Homeplug AV for easier networking

Fortunately, that doesn't necessarily mean you can't pick and mix. Many Nas units, for example, can run both a UPnP server, including DLNA-compliant ones, and at the same time share music via software such as Firefly (**www.fireflymediaserver.org**), which implements the DAAP protocol needed for iTunes. Similarly, devices such as the Soundbridge will see information that's available via both DAAP and UPnP media servers, while a playback device that's DLNA certified should see WMC servers too, since they're both built on UPnP AV.

Linking up

It's also important not to overlook the connectivity side of things; while the DLNA specs embrace Wifi and Bluetooth, those are both standards with different versions, and it's important to make sure that you choose compatible equipment, especially with regard to things like encryption.

When it comes to higher quality media, though, many people are now ditching the crowded Wifi airwaves and using home powerline networking.

With a rated throughput of 200Mbits/sec, even the real-world performance of Homeplug AV is good enough for high definition and, as far as your devices are concerned, they're connected to a standard Ethernet network. But if you thought Wifi interoperability was tricky, you need to be just as careful with mains networking.

The Homeplug AV standard can co-exist with the earlier 14 and 85Mbits/sec Homeplug standards, in that they'll all run on the same wiring – but it won't necessarily talk to them. Backwards compatibility is an optional part of the standard that not many vendors choose to implement. It's not, in that regard, like Ethernet, where a 10Mbits/sec and a 100Mbits/sec device can be plugged into the same switch and communicate. And while different vendors' Homeplug AV kit will talk to each other, watch out for similarly specified but incompatible equipment, for example using the DS2 mains networking standard, or Panasonic's own proprietary system (which will appear inside more Panasonic products in future).

'We think that you are best off sticking to the key standards'

On the positive side, it's a little easier to add Homeplug AV to your network, thanks to new routers such as Zyxel's P660HWP, which has it built in (see review at **www.pcw.co.uk/ 2210057**), so you'll just need an adaptor for your media player.

What to buy

So if you're looking for digital home-entertainment equipment, what should you be looking for? We think that you're best off sticking to the key standards – Wifi for your wireless, Homeplug AV for mains networking, and DLNA-certified equipment for media player, servers and other gadgets. It's also worth keeping an eye out for Certified Wireless USB, when products finally appear in the UK.

Meanwhile, Microsoft's Windows Media Connect isn't going to go away any time soon – but nor is it going to take the market by storm, in our view. The same is likely to be true for Panasonic's mains networking; unless you find it inside your new TV or DVD recorder, stick with the non-proprietary standards for now. **PCW**

Standards coming soon

PCW looked at the Wireless USB standard a few months ago. It's supposed to make it easier to link devices, and some of the uses suggested for it included making it easy to play back photos on your TV, without needing cables.

At 480Mbits/sec, it also provides enough bandwidth to send compressed HD video over the link, demonstrated by Samsung at this year's Consumer Electronics Show. But in the UK, we still haven't seen any products based on the technology.

And it's not the only standard in town. The Wireless HD standard uses a different chunk of radio spectrum, and is focused on very short range links for HD, essentially within the same room; Panasonic is one of the key backers and looks likely to use it in high-definition products.

But right now, these standards don't figure in the DLNA specs, which are based around using wired or wireless networks carrying TCP/IP, and Wifi or Bluetooth for wireless links. So it's unclear at the moment how well devices built around these new wireless standards will work with existing equipment.

And, in the US at least, there's another proposed standard to consider, called HANA (**www.hanaalliance.org**); it's based around linking devices using Firewire, and using the TV to control them all.

The signals can also be sent over the in-home co-ax wiring used for cable TV, or wirelessly – but whether it will make much of a splash outside the US, where Firewire is mandatory on cable set-top boxes, remains to be seen.

Products such as the Soundbridge support UPnP, but that doesn't guarantee full compatibility

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WILL STAPLEY

REVIEWS

GIVE YOUR WIRELESS NETWORK A BOOST

Wifi is often knocked for being too slow and difficult to set up, but it's one of those technologies many would struggle to live without. The 802.11n standard, which offers enhancements over 802.11g, is yet to be ratified, but devices based on the draft specification for 802.11n (Draft N) have been available for some time. With this in mind, we take a look at the current crop of Draft-N routers. Find out which one deserves a place in your home on page 103.

Meanwhile, those looking for a new computer will want to take a look at our group test of sub-£1,000 notebooks on page 89 – and there's a surprise in store for those who think we're always bad-mouthing Apple.

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OUR AWARDS

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Best Buy: The best product in its class in terms of performance, features and value for money

'Once inside the case, Chillblast's attention to details sees all the cabling tucked away in the Fusion Sentinel'

Read the review on page 58

NOTEBOOK

Apple Macbook Air

An impressive design, but with some glaring omissions

The sheer elegance of the slimline design makes the Macbook Air irresistible

Apple says that the Macbook Air is a 'no compromise ultraportable laptop'. That's certainly true in some ways. The unit measures less than 2cm (0.76in) at its thickest point, and even Sony hasn't really disputed Apple's claim that this is the 'thinnest laptop in the world'.

Sony does win on weight as its Vaio TZ weighs just 1.24kg, compared to the Macbook's 1.36kg. However, the Macbook Air has a larger screen – 13.3in compared to 11.1in for the Vaio.

Ultimately, though, Apple's engineers know that there's more to good design than just a spec sheet full of numbers. It's the sheer elegance of the Macbook Air's slimline design that catches the eye, and when you feel how comfortably the machine balances in the palm of one hand you can't help but wonder if your credit card will stretch to buying one.

There's no doubt that Apple has hit the ultraportable nail right on the head. But shrinking the unit to this size has inevitably involved compromises in other areas. The most obvious is the processor. Intel produce a specially customised version of the Core 2 Duo just for the Macbook Air, but the only models available at the moment run at a modest 1.6GHz or 1.8GHz, priced at £1,199 and £1,389 respectively.

Anyone looking for a powerful laptop to replace their desktop PC or Mac should probably look elsewhere as the Macbook Air simply doesn't have the raw horsepower for that. Even so, it is more than adequate for running ordinary business software such as Microsoft Office, surfing the web and handling your email. It's got 2GB of Ram, and while the 80GB hard disk is pretty small the Macbook Air still compares favourably to ultraportable rivals such as the Vaio TZ, which hits a top speed of 1.33GHz with 120GB hard disk and costs a hefty £1,799. A 64GB solid-state drive version is available for £2,028.

You will, however, probably end up spending a bit more on optional extras for the Macbook Air. The ultra-thin design leaves no room for a DVD drive at all, so watching DVDs is out of the question – unless you pay £65 for the optional external DVD drive. Interestingly, using the included Remote Disc application you can install software on the machine over a wireless network by using the optical drive of any other computer you have available, PC or Mac.

There's only a single USB port for connecting peripherals, with no Firewire or Ethernet at all. The loss of Firewire means you can't plug in a DV camcorder, while the lack of Ethernet is just daft. Apple's argument is that the Macbook Air is meant to be totally wireless – fine when wireless routers never fail and the entire world is one big happy wireless hotspot, but until then we do still need Ethernet occasionally. So budget an extra £19 for the USB-to-Ethernet adapter as well.

And it wouldn't be an Apple product if there wasn't one utterly inexplicable design decision. In this case it's the fact that the battery is sealed inside the unit so that you can't extend your working time by swapping in a spare battery when the original runs down – about three hours with Wifi running.

Omissions such as the lack of DVD drive or the non-replaceable battery will mean that the Macbook Air won't be suitable for some people. And it's certainly not powerful enough to replace a desktop PC or Mac. But the sheer size-zero slimness of the unit is hard to beat, so if portability is your top priority, the Macbook Air could be just what you're looking for. *Cliff Joseph*

Verdict

Pros Stunning design; extremely thin
Cons Non-replaceable battery; no Ethernet port; no optical drive; low-end processor
Overall The ultraportable design is impressive, but it comes at the expense of performance and connectivity

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Ease of use	★★★☆☆
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NOTEBOOK PC

Samsung R700

An impressive combination of looks and power

Despite its bulky chassis, the R700 manages to keep its weight down to 3kg

Going by its looks, Samsung's R700 notebook ought to cost more than it does. While no-one is going to mistake it for a Sony Vaio or a Macbook, its design is better than those of similar computers priced at under £600.

The glossy case looks stylish with its rounded design and, while it's not light at a touch over 3kg, it's not too hard to pick the R700 up and move it around the house. As a desktop replacement, albeit a fairly basic one, most people are not going to be taking it out of the house too often.

The reason it qualifies as being only a basic desktop replacement is its graphics card. While more heavy duty workhorse notebooks will include a high-spec card to cope with modern games, this one only uses an Nvidia Geforce 8400M GS with 128MB of Ram. That's not bad, and it certainly beats the on-board graphics to be found on smaller and cheaper models, but it's not going to cope with any kind of recent 3D game graphics – not at good detail levels, anyway. The computer's 3Dmark05 score of 3,188 bears this out.

That said, the other graphical aspect of a home desktop replacement is DVD and video, and in this respect the R700 fares well; it also benefits from the Media Center software included with Vista (Home Premium is installed as standard). The processor is an Intel Core 2 Duo T5450, running at 1.66GHz, backed up with 2GB of Ram. The PCmark05 score of 4,257 is reasonable for this kind of computer.

Samsung hasn't been stingy with the hard drive and ships a 250GB model as standard, so it will have plenty of room for music and video files. The 17in widescreen display is well-suited for movie watching, too, being a high-contrast model, but its glossy coating means screen reflections will be a problem in bright light.

The computer comes with a good-quality keyboard, one on which the keys recess well when pressed, making it pleasant to use even after hours of typing. This is something that good-looking notebooks tend to get wrong, so it's especially good to see here. There are no customisable buttons (for media playback and so on), but that's no great loss.

The three USB ports are welcome, but the R700 lacks a Firewire socket, which will be a problem for anyone wanting to use it for editing video. It does come with both wired Gigabit Ethernet and modem connections, as well as built-in 802.11g capability. Display-wise, there's an HDMI port and a VGA connector, as well as standard audio connections. There's also an Expresscard slot and a multiple memory card reader (for smaller cards only, so it's not much use for Compactflash users). The DVD drive is Lightscribe-capable, so you can burn labels directly if you have a supply of Lightscribe discs.

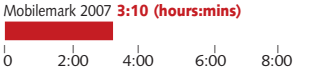
There's a one-year warranty, which is shorter than can be found on some of the R700's competitors, but it is valid internationally, something that's worth a lot should you leave the country with it. That said, the R700's size and weight tell us this laptop isn't going to find its way into many travellers' hand luggage. A maximum battery life of just over three hours is another bonus, although again this notebook is likely to be plugged in much of the time.

The Samsung R700 is a quality desktop replacement notebook housed in an equally impressive chassis. It's certainly capable of impressive general purpose performance, but those after a portable gaming machine will need to look elsewhere. *Anthony Dhanendran*

Performance

PCmark05 **4,257**

Mobilemark 2007 **3:10 (hours:mins)**



Verdict

Pros Huge hard disk; decent design
Cons No Firewire port; poor graphics
Overall Not something that will blow you away, but at this price it's a good, reliable workhorse

Features	★★★☆☆
Performance	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

Price £599

Contact Samsung 0845 726 7864 www.samsung.co.uk
Specifications Intel Core 2 Duo T5450 (1.66GHz) • 2GB Ram • 17in display (1,440x900) • Nvidia Geforce 8400M GS (128MB) • Three USB ports • VGA port • HDMI port • Memory card reader • DVD writer • Windows Vista Home Premium • one-year international warranty

TABLET PC

Toshiba Portege M700-110

Is there still a market for the tablet PC?

There are some interesting features on the M700-110, including two latches which lock the screen in position to prevent it from twisting during use

With UMPCs (ultra-mobile PCs) and truly portable laptops such as Asus' Eee PC, you'd be forgiven for thinking that Microsoft's tablet PC dream was dead and buried. But if you're partial to scribbling text directly onto a screen using Vista's excellent handwriting recognition tools, large-screen tablet PCs, such as Toshiba's Portege M700-110, are hard to beat.

Toshiba has done a good job with the styling and has included some interesting features. To prevent the 12.1in (1,200x800) screen from twisting round during tablet use, two latches either side of the screen lock it into position; this does, however, mean that you have to make sure the screen is perpendicular to the base before twisting it.

The screen can also be used in passive or active mode; the former lets you use any object (such as your fingers) to navigate, while the latter will only work with the included pen which slots neatly into the side of the chassis. Bring the pen close to the screen and the M700-110 will automatically switch off its touchscreen mode and will react only to the pen, which means the tablet won't get confused by your wrist resting on the display. Move then pen away and the display reverts to touchscreen mode, allowing you to use your fingers. Thanks to its LED backlight, the display remains visible outdoors as well as being less of a drain on the battery.

The keyboard benefits from well-spaced, textured keys and there's very little flex while typing, so extended periods of writing isn't a problem. A series of buttons sit at the bottom right of the display, providing quick access to various tablet PC functions. There's also a fingerprint reader, allowing for quick, secure access.

The M700-110 is driven by an Intel Core 2 Duo T7250 processor running at 2GHz. Backed up with 2GB of DDR2 Ram this provides enough grunt for just about any office-based task. A 120GB hard disk also lies within, which will be more than enough for most users, while the Intel X3100 integrated graphics chip reaffirms that gamers should look elsewhere.

PCmark05's memory and CPU tests returned 4,177 and 5,126 respectively, with the overall PCmark05 score sitting at 3,139. Its 3Dmark06 results confirmed this notebook isn't up for anything graphically intensive, with a score of just 614. The M700-110 wouldn't run Mobilemark's test in our labs, but it did manage to last just over two and a half hours when playing back a DVD. Under relatively light usage you can expect to get over four hours, but when running at full pelt this will drop to around one hour 30 minutes.

Draft-N wireless is built-in, so if you have a Draft-N router you'll be able to take advantage of its faster throughput and wider coverage, and a Gigabit Ethernet port is also provided.

Toshiba ships the M700-110 with Windows Vista Business but also includes XP Tablet Edition on DVD for those not willing to upgrade to Microsoft's new operating system.

As far as usability goes, the M700-110 excels – both as a standard laptop and as a tablet PC. One of its biggest drawbacks, however, is its weight. Although 2kg isn't exactly heavy for a laptop when carried in a shoulder bag, actually holding it in your hands is a different matter and, after 15 minutes or so, you'll most likely be struggling. Combine this with the premium you're paying for the tablet design and alternatives such as ultraportable laptops or UMPCs start to look more attractive.

Will Stapley

Performance

PCmark05 **3,139**

3Dmark06* **614**

*Tested at 1,024 x 768 in 32-bit colour

Verdict

Pros Good tablet features; sturdy screen swivel mechanism; good quality screen

Cons Too heavy for long periods of tablet use; expensive

Overall Well designed, but it's too heavy for extended tablet use and is also expensive

Features	★★★★☆
Performance	★★★☆☆
Value for money	★★★☆☆
Overall	★★★☆☆

Price £1,174

Contact Toshiba 0870 444 8944 www.toshiba.co.uk

Specifications Intel Core 2 Duo T7250 (2GHz) • 2GB Ram • 12.1in display (1,200x800) • Intel X3100 graphics • 120GB hard drive • DVD writer • 305x239x37.4mm (wxdxh) • 2kg • Three-year warranty

DESKTOP PC

Arbico Silent 6880GT

Exceptional performance without the need for noisy cooling

The Silent 6880GT uses a select range of components to attain near-silent operation

Arbico is an expanding British PC company created five years ago that now sells around 250 desktops every month. Its latest design, the Silent 6880GT, uses a select range of components to attain near-silent operation.

An Antec Sonata III case is the starting ingredient. It's a small ATX tower standing 42.5cm high with an attractive black steel construction. While some cases use internal foam panels to absorb noise (for example Coolermaster's Cosmos 1000), the Sonata keeps noise down by using an efficient 500W power supply, a slow but variable 120mm system fan and a washable air filter to remove dust.

Removable hard disk caddies with rubber fittings to reduce vibrations are a standard feature of the Sonata III, but Arbico goes a step further by fitting its 500GB Sata hard disk in a dedicated Zalman hard drive cooler. It occupies one of the 5.25in bays, below the DVD writer, and uses an array of heat-sinks to keep the hard drive cool. These not only prolong the drive's lifespan, but also dampen the hard disk clicks heard during use.

A Core 2 Duo E6850 processor and 4GB of Corsair 800MHz DDR2 Ram sit at the heart of the Silent 6880GT. The CPU is overclocked to 3.4GHz, with a 0.075v increase available if the processor should need it. The Ram is overclocked to 850MHz to synchronise with the overclocked front side bus (FSB).

Performance was very good, reflected by a score of 8,817 in PCmark05. Another benefit of using a dual core chip instead of a quad core is that it draws less power and generates less heat, especially when overclocked. A Scythe Katana 2 heatsink and fan kept the temperature down to 49°C under load, with just a whisper of noise.

The CPU drops to 2.55GHz when not under load, where we measured an outstanding 26°C on the die.

Gigabyte's P35 motherboard, used here, has plenty of overclocking potential and provides good connectivity too, with the exception of a Firewire port. Two USB ports, one eSata and a headphone jack sit on the front of the case, while eight USB ports and surround sound connectors are fitted into the rear panel.

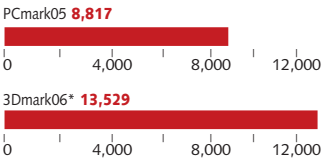
The motherboard doesn't have a second PCI Express slot and you're left with a single Sparkle Geforce 8800GT with 512MB 1.8GHz GDDR3 Ram, which has excellent performance and, in a first for 8800GTs, is silent due to passive cooling.

Excellent scores of 13,529 in 3Dmark06 and 19,810 in 3Dmark05 reflect the 8800GT's pedigree. These scores are even faster than Alienware's 3GHz quad core, dual-8800GTX £2,400 base-unit we reviewed in the April issue, proving that four cores aren't always faster than two. Modern games at high resolutions are within its grasp, proved by the Silent 6880GT managing a just-playable 37fps in World in Conflict at 1,920x1,200 with high details.

Power consumption was relatively low, sticking to 91W when idling and peaking at 175W. Throughout a day of vigorous testing the PC sounded as if it was idling.

Our system came with Windows XP Home, which could only see 3.5GB Ram. Vista Home Premium is a free alternative, although Arbico says XP's performance is better. If you want to see all 4GB Ram, a 64-bit version of Windows can be selected for no additional cost. The high price reflects that quiet technology costs money. You can build an identical system for less, but Arbico configures it well, with delivery and a two-year return to base warranty included in the price. *Emil Larsen*

Performance



*Tested at 1,024 x 768 in 32-bit colour

Verdict

Pros Extraordinarily quiet; great performance; attractive case

Cons Not SLI compatible; price premium for quiet components

Overall A fast PC that manages to remain quiet even when pushed to extreme levels of performance

Features	★★★★☆
Performance	★★★★★
Value for money	★★★☆☆
Overall	★★★★☆

Price £899

Contact Arbico 08456 25 26 27 www.arbico.co.uk

Specifications Intel Core 2 Duo E6850 (2.4GHz) • 4GB Corsair 850MHz DDR2 • 500GB hard disk • Nvidia Geforce 8800GT 512MB • Antec Sonata III case • 500W Antec PSU • Gigabyte P35-DS3R motherboard • DVD Rewriter • Gigabit Ethernet • 10 USB ports • Windows XP Home • Two-year RTB warranty

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- Onboard Gigabit 10/100/1000 LAN port
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DESKTOP PC

Chillblast Fusion Sentinel

A fast, quiet and cool PC offering plenty of scope for upgrades

Personal Computer World BEST BUY

Personal Computer World RECOMMENDED

Better known for creating high-end PCs, Chillblast is targeting the mainstream market with its Fusion Sentinel. As with its more expensive systems, the Fusion Sentinel is based around an overclocked CPU; in this case one of Intel's Core 2 Quad Q6600s. As standard the Q6600 is clocked at 2.4GHz with a 1,066MHz FSB (front-side bus) and 8MB of L2 cache, but the Q6600 is very amenable to a bit of overclocking – even with standard air cooling it can be made to perform much faster.

Chillblast has done just that with the Fusion Sentinel, overclocking it to 3GHz. To ensure the stability of the system, Chillblast has opted for a third party cooler, the Artic Cooling Freezer 7 Pro, which not only keeps the CPU cooler than the standard heat-sink, but also does it extremely quietly.

The quad-core processor sits in an Asus P5K motherboard, based on Intel's P35/ICH9 chipset combination. It uses passive heat-pipe technology to keep both chipset bridges and the MOSFETs cool; the lack of fans on the motherboard also helps keep the noise to a minimum. The board has four Dimm slots supporting up to 8GB of 1,066/800/667 dual channel DDR2 memory. Chillblast has filled all four slots with four 1GB modules of Geil PC2-6400 800MHz fast DDR2 memory which, given the Fusion Sentinel's price, is very impressive.

As you might expect, the Fusion Sentinel doesn't hang about in terms of performance. The Windows Vista's Experience index returned of a score of 5.9, which means there isn't a weak link when it comes to the CPU, memory, graphics, gaming graphics and hard drive. The PCmark05 score of 9,369 is also pretty impressive, putting it just outside the top 10 fastest systems we have tested – not bad for a system costing under £700.

Powering the graphics side of the PC is an Nvidia Geforce 8800GT, which has 512MB of dedicated GDDR3 memory. Interestingly, although the system comes with an Nvidia card, the motherboard supports rival AMD's Crossfire technology, so if you wanted to upgrade the graphics to a dual-card system you would have to replace the 8800GT or switch the motherboard. However, the 8800GT is certainly a good bang-for-your-buck card, giving an overall 3Dmark05 score of 17,895 and an equally impressive 13,822 in 3Dmark06.

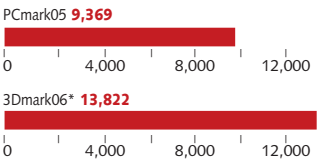
The Fusion Sentinel is a great all-round performer

All of this is built into a black Coolmaster Dominator CM-690 case, which gives you plenty of room to work inside should you want to add or change the components. Despite having four cooling fans, including those for the CPU and graphics card, the Fusion Sentinel is pretty quiet – it's not by any means silent, but neither is it obtrusively noisy. There is also a spare 120mm fan mount in the bottom of the case should you feel the need for more cooling.

Once inside the case, Chillblast's attention to detail sees all the cabling tied up and tucked away. The Dominator CM-690 helps in this respect as the power supply is mounted at the bottom of the case, so only the eight-pin 12v power cable stretches across the motherboard. The PSU is a Thermaltake TR2-500, 500watt unit, so there is plenty in reserve. However, if you're thinking about upgrading the graphics to something more serious you may need to think about investing in a PSU with a bit more grunt.

Although it's by no means the fastest PC we've seen, at under £700 Chillblast has done a great job with the Fusion Sentinel. *Simon Crisp*

Performance



*Tested at 1,024 x 768 in 32-bit colour

Verdict

Pros Quiet; build quality; good performance; value for money

Cons TFT not included in the price; motherboard doesn't support SLI

Overall A well-built, quiet PC with good all-round performance and enough space in the case for future upgrades

Features	★★★★☆
Performance	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

Price £699

Contact Chillblast 0845 456 7830 www.chillblast.com

Specifications Intel Core 2 Quad Q6600 • 4GB Geil PC2-6400 DDR2 Ram • Nvidia Geforce 8800GT 512MB • 500GB hard disk • Windows Home Premium

NOTEBOOK PC

Belinea S.book 1

The first real challenger to the Asus Eee PC, but does it cost too much?

The Asus Eee PC appears to have opened the floodgates, with similar low-cost 1kg notebooks arriving on the scene. Belinea's S.book 1 is the first notebook we've seen to rival the Asus' tiny computer on size, but at £200 more expensive it needs to justify the extra cost.

Like the Eee PC, the S.book has a 7in 800x480 screen, full Qwerty keyboard, trackpad, speakers, 2200mAh battery, a couple of USB ports and Wifi. But that's where the similarities end.

The most obvious difference is the Bluetooth phone. This slots into a recess to the right of the screen, which gives it a rather odd look. The phone pairs easily with Skype but is fiddly to use and, despite its numeric keypad, it can't be used to actually navigate within Skype.

The keyboard is better than the Eee PC's since, although it's not any bigger, the bottom row of keys (including the spacebar) are raised so your thumbs don't continually hit the chassis edge. That said, it is difficult to use the keyboard for extended periods of time. The minute 19mm wide trackpad, with left and right clicks either side of it, is particularly infuriating to use, so a USB mouse is essential. The screen is touch-sensitive and, thanks to a stylus which slides into the case, allows for easy navigation.

The S.book comes with Windows XP Professional installed as standard, rather than Linux, and an 80GB hard disk – an essential inclusion if you're not using a slim Linux installation. These extra features mean it weighs 1kg, slightly more than the Eee PC's 0.92kg, and if you include the bulky power adapter that weight increases to 1.39kg – more than the Eee PC's 1.10kg.

Via components are at the heart of the S.book, comprising a C7-M 1.2GHz processor, 1GB DDR2 Ram (running at a meagre 266MHz) and Via Unichrome Pro II graphics. The Unichrome graphics prevented the S.book from running any of our gaming benchmarks.

The scores were poor across the board in the PCmark05 tests, trailing the all-Intel Eee PC by 10 to 30 per cent in the CPU, memory and graphics sections. Hard disk performance was similar, however.

It's capable of playing MPEG4 video and is fine for internet browsing and Microsoft Office tasks. Via components are very low voltage so we hoped for long battery life, but our reader benchmark could only last two hours, eight minutes, worse than the Eee PC. Via's low-voltage posturing didn't translate into a cool notebook either, with the S.book becoming very warm to touch during use. After a full day's testing it crashed, indicating prolonged stability could be a problem. The hottest part of the laptop is on the bottom side, which doesn't make it particularly suitable to be used on your lap.

There's no built-in webcam, but the notebook's two speakers sound good considering their small size. The S.book's Wifi reception is a little poorer than many other notebooks we've tested. The wireless connection became inconsistent when two walls were put in its path to a router – two other Centrino notebooks we had to hand didn't have the reception problems at this distance.

There are many flaws with the S.book but, in its favour, it is light. The stumbling block is the price – it does little to justify being £200 more expensive than the Eee PC. If you can handle carrying something weighing one or two kilos more, you may as well go for a proper, 15.4in notebook, while those after a miniature PC would be better off with the Asus alternative. *Emil Larsen*

The S.book has an interesting design, but it does little to justify its relatively high price

Performance

PCmark05 **663**

0 | 4,000 | 8,000 | 16,000

Mobilemark 2007 **2:08 (hours:mins)**

0 | 2:00 | 4:00 | 6:00 | 8:00 | 10:00

Verdict

Pros Better keyboard than Eee PC; big hard disk; touch screen

Cons Warm chassis; tiny trackpad; poor performance; expensive

Overall At £420 it's difficult to justify buying this rather than the Eee PC or a cheap 15.4in notebook

Features	★★★☆☆
Performance	★★☆☆☆
Value for money	★★★☆☆
Overall	★★★☆☆

Price £420

Contact Belinea www.belinea.com

Specifications Via C7-M (1.2GHz) • 1GB 266MHz DDR2 Ram • 7in display (800x480) • 80GB hard disk • 802.11g Wifi • Bluetooth • 100Mbits/sec Ethernet • Two USB2 • DVI-I • SD card reader • Windows XP Professional • 230x29.4x171mm (wxdxh) • 1kg

MEDIA STREAMER

Archos TV+

Access movies, music and photos from your PC, the internet or the built-in hard drive

Despite housing an HDMI port, the TV+ can't handle HD video

We recently looked at the Linksys DMA2200 (**www.pcw.co.uk/2208886**) – a media streamer with excellent usability, but one that also required a Vista PC with Media Center to be running.

The TV+ from Archos is similar as it can act just like a standard media streamer, grabbing content off PCs and UPnP Nas devices on your network. But thanks to the internal hard drive (80GB and 250GB versions are available) you can also load content directly onto the TV+ and use it as a standalone media jukebox. The advantage of this is there's no need to have a PC or Nas device on your network switched on and the problems caused by wireless communication are removed.

Archos also has its online Content Portal which lets you stream movies, TV shows and music, but there isn't a great selection of movies. Archos says a new Media Club service will soon be available in the UK, offering a better selection of content and, if you don't already have one, the TV+ will function as a DVR (digital video recorder), using an online EPG and built-in IR blaster to change channels on your set-top box.

Web surfing is also possible (for a fee), but it isn't a totally enjoyable experience. Pages take a frustratingly long time to load and using the remote to move the mouse pointer can be awkward. However, viewing clips on sites such as Youtube works well.

The interface is taken straight from Archos' 605 Wifi. It's uncluttered but Archos could have put a bit of effort into redesigning it. The small remote control squeezes in a Qwerty keyboard along with various navigation buttons, some of which are a little cryptic.

The startup time from cold is very impressive. There are also no fans whirring away so the only noise you'll hear will be the hard disk. During testing, we found the first few seconds of audio and video playback were interrupted by a short pause, but this is only a minor niggle.

There's a huge selection of ports to hook the TV+ up to your home entertainment equipment and the only noticeable omission is optical audio, but coaxial digital is provided. Despite its HDMI interface, the TV+ can't actually handle high-definition video. Archos argues that there isn't enough HD content to warrant it, but with Apple and Microsoft both offering HD movies through iTunes and the Xbox Live Marketplace respectively, it does seem like a strange omission.

In typical Archos style, if you want to experience the full functionality of the TV+ you'll have to purchase extra plug-ins. The web browser plug-in (Opera) is €29.98 (£22), while both the Cinema (MPEG2, AC3 audio) and Video Podcast (H.264, AAC audio) cost €19.99 (£15). Archos' stance is that you should only pay for what you want – if you want everything, the price escalates to just over £300 for the 250GB version.

The lack of HD support will disappoint those with high-definition videos, while Archos' pricing structure means those looking to make full use of the TV+ will have to shell out considerably more than the basic price. But despite these niggles we were impressed with the TV+ and it's up there with the best media streamers currently on the market. Setting it up is a simple task and, although not particularly pretty, it doesn't take too long to get use to the menu system.

If you're looking for an easy way to watch your digital movies, listen to your MP3s and browse photos, the TV+ could be just what you're after. *Will Stapley*

Verdict

Pros Easy to use; built-in hard drive; qwerty keyboard on remote
Cons Full functionality costs extra; slow web browsing; can't handle HD
Overall The lack of HD support is surprising, but this is still a very impressive media streamer

Features	★★★★☆
Performance	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

Price £249

Contact Archos www.archos.com
Specifications 250GB hard drive • 802.11g • Ethernet • USB Type A/Type B ports • Audio support: MP3, WMA, WAV (AAC, AC3 optional) • Video support: MPEG-4, WMV, (H.264, MPEG-2 optional) • Image support: JPEG, BMP, PNG • Inputs: Composite, S-video, component • Outputs: HDMI, composite, S-video, component • Stereo and digital coaxial audio outputs • 250x164x37mm (wxdxh) • 1.3kg

PORTABLE MEDIA PLAYER

Cowon Iaudio Q5W

A serious rival for the more established players?

You can hook the Q5W up to a television using either component or composite connections

Cowon is looking to take on the big names in the portable media player market with its Iaudio Q5W. The 5in display takes up the bulk of the front panel, but there's still room for a full-sized USB port, for transferring digital content from other devices, and one for porting content directly to a TV.

It's feature-packed on the inside as well, with support for all the modern audio and video formats and codecs, FM radio, built-in Wifi, Bluetooth, Flash player and voice recorder. These features are accessed by selecting from an icon-base list of categories down the left and right sides of the screen.

The Cowon allows you to change view modes quickly and features a larger icon view for finger operation and a smaller one for using the built-in stylus – a nice idea, but the small buttons are tricky to use with your finger. Stylus operation is pretty painless and will make it far easier to access the massive range of customisation and control settings for each category of media, including an unprecedented degree of video control, the Jeteffect equalizer for audio and full slideshow creation for photos.

We found that there was a noticeable pause when switching between the various applications, perhaps a result of the Q5W's interface being overlaid on to a Windows CE 5.0 operating system.

Aside from the fact version 6.0 has been around for some time, this choice of operating system offers both advantages and drawbacks. A big plus is that you have Windows-style access to your media and files and can even run compatible games and applications as you would on similar devices. But it doesn't do much for user-friendliness and we can see less tech-savvy users becoming frustrated by the rather verbose menus and, at times, clinical interface. Those looking for that extra degree of control might find it a sacrifice worth making.

As well as viewing media directly you can hook the Q5W up to a television using either component or composite connections.

We were pleased by the playback quality but disappointed by the unresponsive and rather quizzically designed remote control, which makes it difficult to access the sorts of settings you'd usually browse through with the stylus.

In general, audio and video performance is very good, in particular the excellent quality of the 800x480 resolution display. It's superbly clear and vibrant, making it perfect for viewing photos and video.

After setting up a wireless connection you can browse the internet through the CE interface using Internet Explorer. Video clips can be viewed from sites such as Youtube and content can be downloaded to the internal hard drive (40GB and 60GB versions are available).

The Q5W certainly appears to be a worthy contender, and packs an impressive array of features into a fairly portable, albeit rather heavy, frame. Its strengths include the impressive degree of control over your media and the flexibility that the CE-based approach offers, but in reality it's not nearly as pleasing to use as those in the Archos range. And, as you can see from the price tag, it's also substantially more expensive for a relatively meagre internal capacity.

We can see how some users might prefer the Q5W to more mainstream offerings, but for us there are a few too many niggling issues for us to recommend it over alternatives from Cowon's rivals. *Paul Lester*

Verdict

Pros Excellent format support; great display; port to a TV directly; impressive connectivity

Cons Often sluggish performance; poor remote control; expensive

Overall The Q5W is a commendable effort, but it doesn't quite do enough to knock the big boys off their perch

Features	★★★★☆
Performance	★★★☆☆
Value for money	★★★☆☆
Overall	★★★★☆

Price £399 (40GB); £439 (60GB)

Contact Advanced MP3 Players www.advancedmp3players.co.uk

Specifications 5in display (800x480) • Windows CE 5.0 Pro • 40GB/60GB capacities • Up to 13 hours audio playback, seven hours for video • Audio support: MP3, WMA, ASF, OGG, WAV, FLAC, APE, MPC • Video support includes MPEG4, WMV, AVI, DivX, Xvid • Image support: JPEG, BMP, PNG, RAW • 139x20x89mm (wxdxh) • 380g

MEDIA PLAYER

Apple TV

Take two for Apple's set-top box

In a rare moment of humility at the Macworld Expo in January, Apple's Steve Jobs admitted that the original Apple TV was "not what people wanted".

The problem was that the Apple TV merely acted as a middleman between the computer and the high-definition flat-screen TV.

This meant that you had to use your computer to buy films and TV programmes from the iTunes Store, and then download them onto the computer before transmitting them to your TV via the Apple TV box.

It was a clumsy approach, made even less appealing here in the UK by the fact that most of the film and TV material sold on iTunes is only available in the US. So Apple had a bit of a rethink and came up with the Apple TV 'Take 2', as they're unofficially calling it.

The hardware inside the little square box hasn't really changed and the interface is just as slick – the big difference is simply that the Apple TV can now link your HD television direct to the iTunes Store over the Internet without using your computer at all.

It comes with either a 40GB or 160GB hard disk, so it's extremely easy to download material from the iTunes Store to watch at your convenience. Apple has also launched a new movie rental scheme on the iTunes Store – a lot of the movies are in high-definition too, which is great if you own an HD television. However, this rental scheme is currently only available in the US, and we will probably have to wait more than six months before it's launched here in Europe.

There's some decent TV content on the UK iTunes Store, but until we get a quality selection of films, the Apple TV is little more than a very expensive hard disk.

Cliff Joseph

Verdict

Pros Easy to use; connects direct to the iTunes Store

Cons No film rentals currently available in the UK; limited format support

Overall The revamped Apple TV has great potential that won't be fulfilled until the UK gets the movie rentals that are already available in the US

Features	★★★★☆
Performance	★★★★☆
Value for money	★★☆☆☆
Overall	★★★☆☆

Price £199 (40GB); £269 (160GB)

Contact Apple 0800 048 0408 www.apple.com/uk

Specifications 40GB or 160GB hard disk • HDMI and component video • Analogue stereo and digital audio output • 802.11n • Ethernet • 197x197x28mm (wxdxh)

SCANNER

Fujitsu Scansnap S300

A sheet fed scanner small enough to fit in a briefcase

Fujitsu has created an incredibly small automatic feed document scanner in the Scansnap S300, which offers a 10-sheet paper tray capable of handling sizes from A4 right down to business cards.

Powered by either AC or USB it's compact, stylish and while not nearly as small as manual feed scanners it should fit in most briefcases. We see this being used more in the home office and both its design and provided software orient it at digitising documents to try and establish a paperless environment. Indeed, the S300 is only capable of scanning to PDF format and isn't even Twain compatible, so you won't be able to use it with other image applications you might have installed. This sounds like quite a big drawback, and could well put some people off, but if you'll only be digitising documents it's not too much of an issue.

The scanner starts up as soon as you open the lid and is ready to use almost immediately. All quality and configuration settings are managed via the software, and once everything's set up you can simply place a wad of paper into the ADF tray and hit the scan button.

At default quality settings it ploughs through an A4 page in just a few seconds. Documents can also be turned into searchable PDFs on the fly.

If you're looking for high-end performance, perhaps in scanning images, and expect sharp results with accurate colours you'll be let down. Even at optimum quality, at which scanning takes just under a minute per page, we noticed that lines weren't particularly sharp and colours weren't particularly solid or vibrant. The S300 is squarely aimed at the office environment and, while it's very effective, we'd have liked it to be a bit more capable as an all-rounder, particularly at over £200.

Paul Lester

Verdict

Pros Capable of very fast speeds; effective PDF creation and supplied software

Cons Not Twain compatible; only scans to PDF; quality isn't great

Overall The Scansnap S300 is expensive considering its restrictive nature, but if you're only looking to use it for its intended purpose is very capable

Features	★★★☆☆
Performance	★★★★☆
Value for money	★★☆☆☆
Overall	★★★☆☆

Price £220 approx

Contact Fujitsu 020 8731 3450 www.fujitsu.com/uk/

Specifications 600ppi optical resolution • 15ppm (at default quality settings) • 10-page ADF • USB • 77x284x95mm • 1.4kg

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MULTIFUNCTION PRINTER

HP Photosmart C7280

Print, scan and copy in high-quality colour

Despite its Photosmart badge, HP's C7280 is actually a multi-talented device. In addition to printing it can scan and copy as well as send and receive faxes. That puts it very much in the home office category – after all, very few home users make use of a fax machine these days.

Photo quality was extremely impressive – colours were both vibrant and bright thanks to the printer using six individual ink cartridges for photo printing. With all the quality settings at maximum, we clocked it at six-and-a-half minutes for a borderless A4 print. At default settings it took around two-and-a-half minutes, while a draft colour photo print took 90 seconds.

Text printing peaks at four seconds per page; it took 12 seconds to get through the first page.

At the highest quality setting, text was bold and dark with little bleed, but this took it to around 40 seconds per page.

A good balance is struck in default text mode, at 12 seconds per page. Results in normal mode varied with paper, though, with HP obviously recommending you use their own stock.

As expected given the high price tag, the C7280 can be hooked up to a network either via an Ethernet cable or wirelessly; the wireless setup was impressively painless. It also accepts all manner of memory cards, USB-connected cameras or storage devices and even photos from phones via Bluetooth. The small colour screen is enough to be able to do some rudimentary editing, and it can automatically resize prints in several ways. The duplex unit, meanwhile, is good for saving on paper, and the fax will be useful for some.

The Photosmart C7280 is clearly aimed at home office users who need both a fax and great photos, and with high quality printing, scanning and copying it's an impressive piece of kit. *Anthony Dhanendran*

Verdict

Pros Excellent photo quality; reasonable speed; versatile

Cons Text quality is variable; fax is of limited use

Overall A versatile printer for the home office that performs extremely well

Features	★★★★★
Performance	★★★★★
Value for money	★★★★☆
Overall	★★★★☆

Price: £249 inc Vat (£212 ex Vat)

Contact HP 0845 270 4215 www.hp.com/uk

Specifications 1200dpi printer • 4800dpi 48-bit scanner • 64MB Ram • Bluetooth • 50-sheet document feeder • 10x15cm paper feeder • Pictbridge • Duplex unit • USB • Ethernet • 802.11g • six colour ink tanks • 450x444x428 mm (wxdxh) • 11.5kg

MULTIFUNCTION PRINTER

OKI C3530 MFP

An expensive, yet solid performing multifunction printer complete with fax support

With print, scan, copy and fax features, the C3530 is based on OKI's well-established single-pass LED technology.

It sports a large, backlit LCD with a multi-line display that allows OKI to use a menu system in place of the multitude we usually see on multi function displays. However, many of the menu options are quite cryptic abbreviations.

Disappointingly, some of the C3530's functionality isn't available over a network connection. While it's easy to scan to a network location using the printer's control panel, you can't initiate a scan from the PC unless it is directly connected via USB. However, scanning from the device's own control panel provides a variety of options including network, email and USB.

The supplied driver discs didn't support Windows Vista, but a visit to OKI's website provided all the files we needed. However, the instructions were sparse.

OKI is capitalising on the popularity of HD by offering what it calls 'High-Definition' colour. While prints are certainly sharp, we've seen better colour reproduction from some competitors, although the C3530 does impart a very pleasing finish to its output with a subtle hint of gloss.

Its performance is also among the fastest we've seen, with high speeds available in both colour and monochrome.

The toner capacity is on the low side – its cartridges can print 2,500 pages per black cartridge and 2,000 for each colour cartridge, which is half what we've seen on competing products. Thankfully the prices are also low, so while you may have to replace the cartridges often it won't be as expensive to do so. *Paul Monckton*

Verdict

Pros Performance; output quality; build quality; software bundle

Cons Physical size; cryptic menus; low-capacity toner cartridges

Overall A rather expensive MFD, but a solid performer with a good set of features and low running costs

Features	★★★★☆
Performance	★★★★☆
Value for money	★★★☆☆
Overall	★★★☆☆

Price £844

Contact OKI 0800 917 6015 www.oki.co.uk

Specifications 1200x600dpi print resolution (2,400dpi enhanced) • 128MB Ram • 16ppm colour, 20ppm mono • 50-sheet ADF • fax • USB2 and Ethernet 10/100Mbits/sec • 250-sheet input tray • 150-sheet output tray • 447x547x521mm (wxdxh) • 29kg • One-year warranty

MOTHERBOARD

Sapphire Crossfire X

An expensive, but well-designed board with decent overclocking potential

After a short hiatus, Sapphire is returning to the motherboard market with range of AMD based modes. The first one to arrive is the Crossfire X, or the PC-AM2RD790 if you prefer product codes, which is part of its Pure range of boards.

Built around AMD's AM2+/AM2 socket and its latest 790FX chipset, the board supports all AMD's socket AM2 processors as well as the latest Phenom range. Like many motherboards currently available, the AM2RD790 uses heat-pipe technology to keep the chipsets cool – the two that cover the chipsets are tiny in comparison to the huge one keeping the digital power chips and ceramic capacitors cool.

Although we didn't have problems with the chipsets getting too hot during testing, we have seen reports of some motherboards locking up due to excessive heat – it's therefore worth making sure your case has plenty of cooling. On the plus side, all the heat-sinks are fixed to the board with screws so you know they are making good contact with the components underneath.

Although labelled as a Crossfire X, the board has only three x16 PCI Express 2.0 slots instead of the four supported by the Crossfire X reference specs. However, the advantage of this is that there's space on the board to use full-size, dual-head cards.

The board doesn't have integrated audio, with Sapphire instead bundling a Berstein eight-channel expansion plate. Based on Azalia's 24-bit 192KHz HD spec, this plugs into a header on the motherboard via a short ribbon cable. As far as expansion goes, there are three PCI slots and a single x4 PCI Express slot. Although the paper manual covers the board in some detail, there is no coverage of any Bios options – a surprise since there are a number of overclocking options available.

It might be expensive, but this is a well-designed board from Sapphire. *Simon Crisp*

Verdict

Pros Well designed; space for large graphics cards

Cons Only three x16 PCI Express slots; Bios not covered in documentation

Overall Sapphire is back in the game with a well-laid out board that performs well, although it is a little pricey

Features	★★★★☆
Performance	★★★★☆
Value for money	★★★☆☆
Overall	★★★★☆

Price £171.61

Contact Sapphire 08701 288 310 www.sapphiretech.com

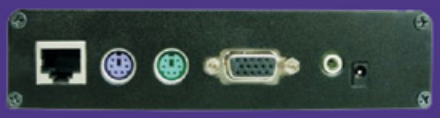
Specifications Socket AM2+/AM2 • Four Dimm slots • Three PCI Express x16 slots • One PCI Express x4 slot • Three PCI slots • Six Sata2 ports • Berstein eight-channel audio

Smaller Is Better

QLX Pro Ministation Thin Client

Up to 30 Simultaneous Users On One PC

Thin Clients are cheaper, quieter, easier to manage and more secure than standard PC's. The idea is that the Thin Client has just enough resources to connect to a PC server or workstation and draw the users screen over the network. It's cheaper to manage, because Thin Client hardware doesn't need to be updated anywhere near as often as traditional desktop PC's - a typical PC has a useful life of around 1 year and is full of complicated parts that can fail. Thin Clients, on the other hand, are extremely simple devices with no moving parts, and because all the memory, processing power and storage comes from the server, looking after multiple desktop machines has become an unnecessary expense. The average PC consumes around 400 watts compared with only 5 watts by the QLX Pro Ministation. Connect up to 10 users with Windows 2000/XP and up to 30 users with Windows Server*



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MOTHERBOARD

MSI P6NGM

Personal Computer World RECOMMENDED

A great value motherboard for home theatre PCs

A compact motherboard with a good set of features

MSI's P6NGM is an ideal board to build a compact or home theatre PC around, especially the latter as it comes with a HDMI port onboard.

Built on MSI's familiar red PCB, the P6NGM is a Micro ATX format board that, despite its compact size, is well laid out with space between the memory latches and the graphics card slot.

But there are a couple of niggles: the USB headers are placed at the back of the board, which might cause problems with the front panel USB connectors in some PC cases, and if the Com port header and the Front Panel header were swapped around it might make life easier too.

The board uses a passively cooled Nvidia MCP73U chipset to support Intel's Socket 775 processor range with FSB speeds of 1,333, 1,066, 800 and 533MHz. The board provides two single-channel Dimm slots that support up to a maximum of 4GB of 800/677 or 533MHz DDR2 memory.

The motherboard gives you a choice when it comes to graphics – there's a single x16 PCI Express slot for a dedicated graphics card or you can opt for the onboard graphics powered by the Geforce 7150m GPU, which is clocked at 630MHz and has a 256MB frame buffer.

As well as the graphics card slot there is a single x1 PCI Express slot along with two PCI versions, which should be enough as both the eight-channel HD audio and Gigabit Ethernet are integrated into the board.

The four 3Gbytes/sec Sata ports are mounted towards the edge of the board and are far enough away from the x16 PCI Express slot so that only the longest graphics cards will obstruct them.

Overall, this is a compact motherboard with a surprisingly good set of features which would be best put to use in a home theatre PC. *Simon Crisp*

Verdict

Pros HDMI port; compact design

Cons USB headers at the rear of the board

Overall Compact, well designed board with a good feature set and a stunning price tag

Features	★★★★☆
Build quality	★★★★☆
Value for money	★★★★★
Overall	★★★★☆

Price £39.25

Contact Compact, well-designed board with a good feature set and a stunning price tag

Specifications Micro ATX format • Socket 775 • Two Dimm slots • Integrated graphics • One x16 PCI Express slot • One x1 PCI Express slot • Two PCI slots • HDMI

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GRAPHICS CARD

Sapphire HD3870 Atomic

Overclocked core and memory along with some advanced cooling

Sapphire's HD3870 Atomic is the first product to be launched under the company's new Atomic range of gaming hardware. It's also the first HD3870 we have seen that uses a single-slot cooling solution instead of the reference dual-slot cooler design.

To prove just how efficient the cooler is, Sapphire has tinkered about with the both the core and memory speeds. The core clock runs at 825MHz, 50MHz above reference, while the 512MB of GDDR4 memory is rated at 1,200MHz (2.4GHz effective) rather than the standard 1,100MHz (2.2GHz effective).

The memory modules are made by Samsung, with the K4U52324QE-BC08 chips rated at 0.8ns and with a clock speed of 1,250MHz (2.5GHz effective) – the fastest GDDR4 memory currently available.

To cool the Atomic, Sapphire has used its new Vapour-X cooler, which makes use of vapour chamber technology. This works like a two-way heat-pipe (heat-pipes usually only work in one direction), which offers lower thermal resistance and much better, and faster conductivity than standard heat-pipes. In effect, the base of the heat-sink is a very large, flattened cooper heat-pipe. Indeed, it works so well it actually keeps the card 10-15 degrees cooler than the reference dual-slot design.

The card is built on a red PCB and uses a six-pin PCI Express power adapter to provide extra power over and above what the PCI Express slot provides.

It's not often that the packaging of a product warrants a special mention, but then it's not everyday that a graphics card is sold to you in a small metal flight case. The card is securely held by foam under which sit all the rest of the hardware bundle including a pair of small cold cathodes and a three-metre HDMI cable.

The advanced cooling might push up the price a little, but it's an impressive design. *Simon Crisp*

Verdict

Pros Effective cooling; overclocked core and memory

Cons The innovative design pushes up the price tag

Overall A stunning version of the HD3870, combining overclocked core and memory clocks with a single-slot cooling design

Features	★★★★☆
Ease of use	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

Price £188

Contact Sapphire 08701 228 310 www.sapphiretech.com

Specifications ATI/AMD RV670 GPU • 825MHz core clock • 2.2GHz effective memory clock • 512MB GDDR4 • Two dual-link DVI ports

DIGITAL VIDEO RECORDER

Nikkai Barebone Twin Tuner Freeview DTR

A do-it-yourself way to record digital TV

Digital video recorders, or DVRs, have recently made the move from expensive luxury products to affordable devices that are well under £100. Nikkai has come up with a new and rather unusual version, though: this is a PVR that you have to finish yourself.

The name Barebone might remind some of the fiddly process of putting together many small form factor PCs, but in fact this recorder is a cinch to assemble. After opening the access hatch, it's simply a case of screwing a 3.5in IDE hard disk into place, connecting two cables and then closing the case. After that, simply plug in your aerial, along with the rather strange external jumper that links the two TV tuners, and you're ready to record.

The on-screen menus aren't particularly pretty and the remote control is small and fiddly, but it does work reasonably well: we managed to quickly pull up the electronic programme guide (EPG), choose a show to watch then set another to record. The interface isn't anywhere near as slick as that of Sky+, for example, but it will suffice for occasional TV viewers.

There are, however, two significant problems for this device. The first is noise: many desktop hard disks are noisy, and its slim case does little to dampen this. When not in standby mode, the hard disk is always spinning, even if it's not recording at the time. We also found that the constant high-pitched hum of our hard disk was enough to put us off watching TV. If you want to use it in the living room, you'll need to carefully select a quiet hard disk.

What's more, it's not particularly good value. By the time you've added a hard disk you might as well simply take the easy route and buy Thompson's Top-Up-TV Plus recorder for around £90. *Tom Royal*

Verdict

Pros Easy to assemble; works reasonably well

Cons Noisy; not necessarily cheaper than a pre-assembled DVR

Overall Will work acceptably well if you choose a quiet hard disk, but you might as well pick up a ready-made PVR and save the trouble

Features	★★★★☆
Performance	★★★☆☆
Value for money	★★★☆☆
Overall	★★★☆☆

Price: £59.99

Contact Maplin 0870 4296000 www.maplin.co.uk

Specifications Requires a 3.5in IDE hard disk (up to 500GB) • Two digital tuners • Seven-day EPG • Two Scart outputs • Composite and S-video outputs • Phono and coaxial S/PDIF audio outputs

WIRELESS ANTENNA

Hawking HA12W

Focus your wireless network's coverage to where it's needed most

With most wireless routers housing an omni-directional antenna, unless you place one in the middle of your house you're effectively wasting a large proportion of the wireless signal.

The HA12W is a 12dBi directional antenna that lets you focus your network's signal in one direction. So, for example, you could place it at the front of your house and direct it to face the back door, thereby increasing the wireless coverage where you need it.

A 150cm cable is included to attach the HA12W to your router – adapters are included for the most common aerial connector types (RP-SMA and RP-TNC). It does, however, require a router with a detachable antenna; most do, but some have non-removable antennas. You can also attach it to your desktop or laptop using a wireless adapter with a removable antenna (Hawking's Wireless-G USB Adapter costs £24.99). Window and wall mounts are included.

Using an 802.11g laptop and router we travelled to the edge of our network's coverage until we lost the wireless signal altogether. By attaching the HA12W to the router and carefully positioning it to face the direction of the laptop we managed to not only reconnect to our wireless network, but also achieve a good signal strength. With the HA12W attached to a notebook, we also located previously undetected nearby networks; the directional nature of the antenna particularly noticeable here, with a slight change in direction resulting in different networks being uncovered.

If you need to increase your network's coverage in a specific direction, the HA12W is worth trying, but bear in mind that its directional nature means it won't suit those who need their network to span a wide area. *Will Stapley*

Verdict

Pros Increases coverage in a specific direction; easy to set up

Cons Reduces the span of your network's coverage

Overall Perfect for those who require a stronger wireless signal in a specific direction

Features	★★★★☆
Performance	★★★★☆
Value for money	★★★☆☆
Overall	★★★★☆

Price: £42.99

Contact Hawking Technology

Specifications Directional wireless • wall/window mount kit included • 150cm extension cable • 80x22x327mm (wxdxh) • 227g • One-year warranty

SAT NAV

Panasonic Strada CN-GP50N

Excellent navigation and superb ease of use

The CN-GP50N is Panasonic's first foray into the European sat nav market. It's a sleek device that features an SD/MMC slot and a beefy internal speaker alongside a power switch on the exterior.

It started up quickly with a decent time to first fix of under two minutes and, thanks to the large controls and clear layout, navigation was straightforward.

We were impressed by its performance on the road. Panasonic manages to cram a huge amount of data onto the 5in display, including current speed and time to destination, the name of the current and next road, and distance to the next turning complete with a countdown bar to help pinpoint the right junction at busy interchanges. You'll also see a diagrammatical representation of the next turnoff along with a lane assistant view that prepares you for the subsequent instruction at places such as double roundabouts.

You'll see road names and points of interest dotted around your position, and there are even 3D images of popular locations in major cities in Europe.

Despite all of this information, the map view is extremely clear and easy to read at a glance, mainly because of the clever semi-transparent nature of the information boxes that allow you to see through to the road layout underneath. Additionally you'll find speed camera alerts, full European map coverage and a voice recognition facility to allow the driver to vocally programme the details of a destination.

In terms of navigation then the CN-GP50N fares very well, but does let itself down a bit when it comes to extras. There's built-in Bluetooth to pair with a phone and a photo viewer, but no MP3 player and a TMC unit must be picked up separately for traffic information. So those looking for an all-in-one multimedia companion will need to look elsewhere, but in terms of pure navigation it excels. *Paul Lester*

Verdict

Pros Excellent display; detailed, clear maps; impressive performance

Cons Doesn't have a lot of built-in extras; TMC an optional extra

Overall From a purely navigational standpoint the Strada GP50N is excellent, it's just a shame there aren't a few more bells and whistles

Features	★★★☆☆
Performance	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

Price £220

Contact Panasonic 0844 844 3852 www.panasonic.co.uk

Specifications 400MHz processor • 5in display (480x272) • European maps • Up to four hours battery life • Bluetooth 1.2 • 129x31x87mm (wxdxh) • 275g

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Computer active review

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(CODE PC09)

Altec Lansing Orbit IM207

Price £30 **Contact** www.alteclansing.co.uk **Overall** ★★★★☆

The Orbit IM207 is a pocket-sized portable speaker, powered by three AAA batteries, and designed for playing music from portable media players and mobile phones. Sitting with the speaker pointing directly up, the idea is that it emits sound in all directions.

There are no control buttons on the device at all: it is switched on and off by twisting the top section. There is no volume control either, so you need to use the control on the device playing the music. It comes with a 3.5mm jack (a 2.5mm adapter is supplied), but the cable is short at just 6in.

The sound quality is better than might be expected from such a small speaker, but there's not a lot of bass. *Tim Smith*

Overall: A good speaker for those on the move

Avermedia AverTV Hybrid STB9

Price £129 **Contact** www.averm.co.uk **Overall** ★★★☆☆

The STB9 is an analogue and digital TV tuner that outputs directly to your PC monitor, bypassing the PC altogether. It has a seven-day electronic programming guide and a remote control to make TV navigation a doddle.

A DVI pass-through means the box can sit permanently between your PC and monitor, while component and composite inputs let you plug in a DVD player or games console.

It gives a PC monitor several uses and its only flaw lies in its output resolution. Most LCD monitors can handle HD, but the STB9 will only output TV at 1,024x768 and won't accept HD input from Freeview HD or an Xbox 360, for example. *Emil Larsen*

Overall: A great idea but can't handle true HD content

Lite-on BD-Rom DH-401S

Price £125 **Contact** www.liteonit.com **Overall** ★★★★☆

We were surprised to see Lite-on offer a Blu-ray drive that could not write to Blu-ray blanks or DVD blanks. This means you'll almost certainly need a second drive in your PC for regular CD and DVD burning.

It comes with a Sata data cable and two attractive bezels; one silver and one black. Stripped-down Cyberlink software, which is limited to stereo sound output, is included for Blu-ray movie playback.

It's not the quietest optical drive we've tested – you'll hear a small squeal as it reaches maximum speed – but since it can be bought online for less than £100, and with Blu-ray winning the HD movie war, it's a great buy. *Emil Larsen*

Overall: A really cheap and attractive Blu-ray and DVD reader

Oneclick Intellipanel for Laptops

Price £29.95 **Contact** www.oneclickpower.com **Overall** ★★★★☆

The Intellipanel is a multi-plug surge protector that dedicates one plug for your laptop and seven plugs for your computing peripherals. When the laptop turns off or goes into standby, power is severed to the other seven plugs so standby power isn't wasted.

All that extra standby juice is swapped for a 0.4W power draw by the Intellipanel. A USB cable detects if the laptop is charging, rather than being turned off, so it'll keep your peripherals severed.

Oneclick couldn't tell us how much carbon dioxide is produced making the Intellipanel and, in many cases, it will take a few years of use to recoup its price tag. Emil Larsen

Overall: Good for reducing pointless power draw

PC essentials

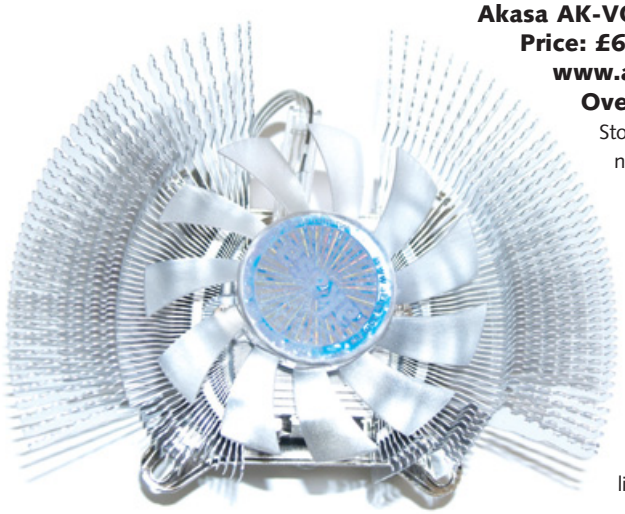
Our pick of the latest components and accessories

Kingston SD4/16GB
Price: £118.36
www.kingston.com
Overall: ★★★★☆

With the megapixel count of digital cameras forever rising, the need for larger capacities of flash media shows no sign of stopping. Kingston has just launched its largest capacity SDHC card to date, the SD4/16GB. It's a16GB card that is rated at Class Four speed, which means you'll get a minimum of 4Mbytes/sec transfer speeds.

Akasa AK-VOC01-CC
Price: £6.99
www.akasa.co.uk
Overall: ★★★☆☆

Stock graphic card fans are notorious for suddenly getting very noisy, not that many of them are quiet in the first place. Akasa's VC01 is a radial cooler with more than a passing resemblance to a Zalman 'half flower' cooler, with the heatsink and cooling fins built from aluminium. Check out Akasa's website for the full list of compatible cards.



Crucial Ballistix Tracer Red
Price: £55.21 (2GB); 110.44 (4GB kit)
www.crucial.com/uk
Overall: ★★★★☆

For those who don't know, the Tracer version of Crucial's Ballistix performance memory is the one that comes with funky flashing LEDs on the top of the module and a further set of lights on the base. The latest special Tracer Red modules come with two rows of red activity LEDs on the top, red LEDs at the base and red PCBs to match.

Be-Quiet Dark Power Pro 850W
Price: £169.20
www.be-quiet.net
Overall: ★★★★☆

You may not have heard of Be-Quiet, but it's a German-based company that is steadily making inroads into the power supply market in the UK. The Dark Power Pro line of PSUs features a modular design and delivers high loads as quietly as possible. The range starts at 450W, continuing right up to 1,000W.

Toshiba MK2035GSS
Price: £76.85
www.toshiba.co.uk
Overall: ★★★★☆

It's been around for a little while, but a recent price drop means there's never been a better time to buy Toshiba's 200GB Sata2 hard drive. At just over £75 it's ideal for building into small pocket-sized external hard drive enclosures. The drive uses two platters to get to its capacity, an 8MB cache and a 4,200rpm spin speed.

OCZ XTC
Price: £14.37
www.ocztechnology.com
Overall: ★★★☆☆

With today's high-end motherboards allowing some serious overclocking of memory modules, the need to keep them as cool as possible is of growing importance. OCZ, which make some of the fastest modules around, also makes this XTC unit. It's an active memory module cooler with two, quiet 60mm fans that clips to the Dimm socket retention levers.

Freecom Hard Drive Pro 1000GB
Price: £285.15
www.freecom.com
Overall: ★★★☆☆

Stylish for a drive enclosure, the Hard Drive Pro is finished in black and silver and comes with USB2, Firewire 400 and two Firewire 800 interfaces. It houses a 1TB 3.5in drive and features a Sync button for quick data backup.

Cyperpower
CPS500NBP
Price: £14.40
www.cyberpowersystems.com
Overall: ★★★☆☆

Small and light enough to hide away in the bottom of your notebook bag, Cyberpower's CPS500NBP is a surge protector for the mobile user and features 500 Joules of surge protection. It comes with both two- and three-prong AC adapters, so most makes of notebook can be covered. It also sports single RJ-45 and RJ-11 ports for Ethernet and phone/modem protection.

Dicota E-Sports Bag
Price: £81.26
www.dicota.com
Overall: ★★★☆☆

E-Sports has a large range of bags from a pink notebook bag up to this massive E-Sports Bag. Measuring 630x350x510mm (wxdxh) and weighing in at 4.2kg, it's been designed for the Lan party user to take both their system and, believe it or not, up to a 20in widescreen TFT.

Hiper HPU-4M630
Price: £55.99
www.hipergroup.com
Overall: ★★★★☆

Hiper's Type-M range of PSUs offers 85 per cent efficiency, very low levels of noise (Hiper quotes 20dBA under normal load) and four independent 12v rails. Six models (530W up to 880W) are all finished in matt black with gold-plated connectors for better conductivity.

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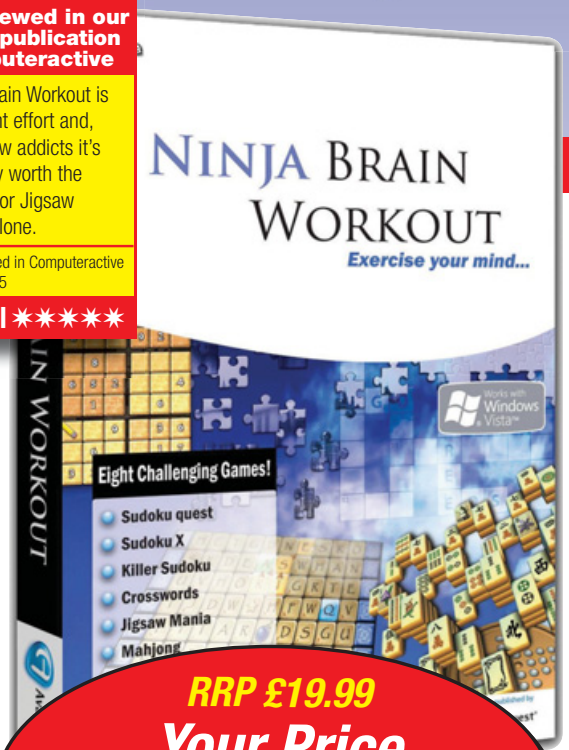
As reviewed in our sister publication Computeractive

Ninja Brain Workout is a brilliant effort and, for jigsaw addicts it's probably worth the money for Jigsaw Mania alone.

As reveiwed in Computeractive - issue 245

Overall ★★★★★



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System Requirements: Windows Vista/XP/2000 Pro, Pentium 500Mhz, 128Mb memory, 100Mb Hard disk space

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(CODE PC10)

IMAGE EDITING

Apple Aperture 2

An impressive update to Apple's advanced photo-editing application

With more than 100 new features this is the most significant release of Aperture yet

Unlike Photoshop and other image editing applications, Apple's Aperture is primarily a photo management application aimed at helping professional photographers sort, compare, file and print photos. It does have some editing tools, such as a retouching brush, but mostly confines itself to quick and easy exposure and colour adjustments that can be applied as part of a studio workflow.

This is the first paid-for upgrade to be released since version one of Aperture appeared in late 2005. Of earlier updates only the 1.5 release in 2006 added any significant new features, the others addressing performance and stability issues and including support for Intel Macs.

This time around, Apple has really pushed the boat out. With more than 100 new features this is the most significant release of Aperture yet. Apple has addressed virtually every area of Aperture, improving performance, adding new adjustment and editing tools, improving integration with iPhoto and .mac, and refining the interface.

Though it works with JPEG, TIFF and other image file types, Aperture is primarily designed to work with RAW files. This version has a new RAW conversion engine that interprets the image data to produce an RGB file. Most of this process is automatic and as well as improving overall results Apple has added new RAW Fine tuning controls for better rendering of colours and for removing moiré patterns and edge fringing.

A major strength of RAW file formats is that they are more forgiving of exposure errors. Aperture 2 makes the most of this, providing new highlight and shadow recovery tools. The new Recovery and Black Point sliders can be used in combination with existing tools like Shadow and Highlight to restore blown out highlights and dense shadows. To help with this, there's a new feature which shows over- and under-exposed areas on a mask overlay. The one disappointment we experienced was that, in isolation at least, Aperture's new recovery tool proved less effective than we'd hoped at restoring highlight detail in heavily over exposed images.

Most image-editing applications have contrast and saturation controls, Aperture 2 has supplemented these with Definition and Vibrancy sliders. Definition enhances local contrast in hazy parts of the image without affecting overall contrast. Vibrancy increases saturation, but only for desaturated colours, so you don't get unnatural 'Dr Who' style effects with colours becoming extremely over-saturated. Vibrancy also holds off changing skin tones, so you can achieve more natural boosting of colours in people shots.

The old Aperture interface wasn't what you'd call cluttered, but even so, it's been simplified by combining the Projects pane and the Metadata and Adjustments Inspectors into one tabbed Inspectors panel. After only a short while working with the new setup we were won over by its ease of use.

Since it leaves original master files untouched, producing versions of the originals to which an edit list is applied on the fly, Aperture has frequently caught flack for its slow performance. Apple has addressed the issue by introducing a Quick Preview mode that uses a JPEG preview to display the image rather than the raw data. This works fantastically well, providing a good enough (i.e. barely distinguishable from the original) image at screen resolution for searching, comparing and so on and allowing lightning fast scrolling through projects containing large numbers of photos. Exporting images, which in prior versions led to everything else grinding to a halt, now happens in the background.

Existing users and those holding off making an Aperture/Lightroom choice will be very pleased with this release.

Ken McMahon

Verdict

Pros Moves faster, looks leaner, and has better adjustment tools

Cons New highlight recovery needs a leg-up from other tools

Overall A huge improvement on earlier versions, but some work still needed on exposure correction tools

Features	★★★★☆
Ease of use	★★★☆☆
Value for money	★★★★★
Overall	★★★★☆

Price £129 (£65 upgrade)

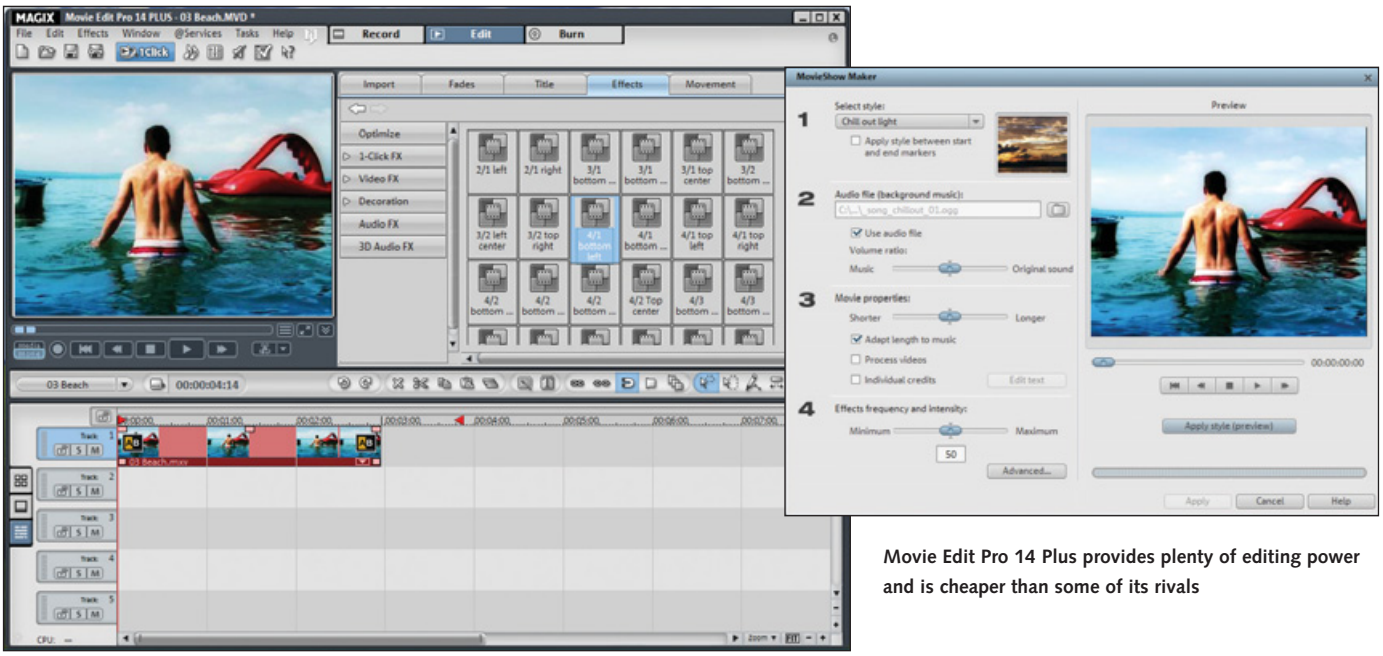
Contact Apple 0800 048 0408 www.apple.com/uk

System requirements 2GHz Intel Core Duo or dual 2GHz PowerPC G5 processor • 2GB Ram • Mac OSX

VIDEO EDITING SUITE

Magix Movie Edit Pro 14 Plus

A powerful and affordable video-editor that still has a few rough edges



Movie Edit Pro 14 Plus provides plenty of editing power and is cheaper than some of its rivals

There's no doubt that Movie Edit Pro 14 Plus is packed full of useful video-editing tools. However, those features are often presented to the user in a somewhat untidy manner.

The first worrying sign was discovering that the 128-page manual was accompanied by a separate 128-page supplement to the main manual. The supplement says that it acts as an introduction to 'fades, effects, and edits', which are the sort of basic editing tools that ought to be covered in the main manual rather than a supplement. As a result, we found ourselves constantly flicking back and forth between the two manuals as we introduced ourselves to the program.

The installation process is rather long winded too; this is due to the fact that Movie Edit is accompanied by a number of additional bundled programs, including a simple 3D animation program, photo editor and a program for compiling music playlists that you can use as soundtracks for your video projects.

When you eventually enter the main editing program, you'll see that it offers three main working modes, which are activated by buttons running across the top of the screen. The Record mode allows you to import audio and video clips, and quickly arrange them into a simple storyboard sequence in the program's Timeline window. You can do some simple editing here, adding text to individual clips, or adjusting colour controls to improve image quality. However, importing clips can be a slow process as the program annoyingly keeps asking if you want to merge each new clip with the previous clip or keep it as a separate clip.

Click on the Edit button and the program switches into its main editing mode, which offers a very wide range of transitions, special effects, and other tools. In this mode, the Timeline window also changes to provide more detailed control over the editing process. It allows you to work with up to 99 separate tracks, which makes it possible to perform very complex editing work.

The program's interface can start to look a bit crowded and confusing at this point, but there's also a '1-Click' button at the top of the screen that provides help for less experienced users. Pressing this button activates a window called the Movieshow Maker, which can gather the video clips you place in the Timeline and turn them into a complete project by automatically adding music and some simple effects and transitions. The program also includes some useful templates that can help you with more complex tasks, such as creating picture-in-picture effects.

Finally, there's the Burn mode, which allows you to create DVD menus so that you can burn your movie projects onto a DVD. Other export options include the ability to upload files straight onto Youtube, and MPEG4 support for exporting files onto handheld devices such as an iPod or Playstation Portable. Unfortunately, for some reason you have to go through an annoyingly convoluted online-or-telephone activation process to use either the MPEG4 or MPEG2 features (MPEG2 is needed for burning DVDs).

Movie Edit Pro 14 Plus provides plenty of editing power – enough to compete with rivals such as Adobe's Premiere Elements, or Pinnacle Studio and it's cheaper than both. However, it lacks the streamlined interface and ease of use that they offer, so Magix needs to work on its presentation and usability to match the sheer slickness of its video-editing rivals. *Cliff Joseph*

Verdict

Pros Powerful video-editing tools; competitive price; lots of additional software included

Cons Poor documentation; cluttered interface; MPEG encoding requires online activation

Overall A powerful and affordable video-editor, marred by poor documentation and online activation for basic export options

Features	★★★★☆
Ease of use	★★★☆☆
Value for money	★★★★☆
Overall	★★★★☆

Price £59.99

Contact www.magix.com/uk

System requirements 1GHz processor (3GHz for editing HD video) • 1GB Ram • 3GB hard disk space • Windows 2000/XP/Vista

FIRST-PERSON SHOOTER

Unreal Tournament III

Another year, another Unreal game, and the same formula repeated

Unreal Tournament III is actually the sixth game to carry the Unreal badge, and many will call it UT2007, but its game engine is in its third incarnation, which is where the name stems from.

The Unreal series is famed for its addictive multiplayer mode, which remains the meat and potatoes of this release. There is a wealth of game modes available, including regular deathmatch, team deathmatch and capture the flag maps. New Warfare maps involve transporting glowing orbs to capture nodes, which is a fun sort of join-the-dots cum basketball-with-guns game. Vehicles are also used to make some of the larger maps more manageable.

If multiplayer isn't your thing, then Unreal Tournament III should be avoided since the single player mode is just regular team deathmatches with pretty cinematics in-between.

We had the luxury of testing both the Playstation 3 and PC version of this title and, although the graphics look colourful on both, the PC version looks better if you have a high-end PC. The Playstation 3 only renders the game at 30 frames per second (fps) and, feels noticeably slower on the console.

The PS3 version does offer more populated servers than on the PC version though; on the PC we struggled to find many decent servers.

The game is the fastest first-person shooter we've played recently. Double jumps, quick sidesteps and quick fire guns combined with razor-sharp movements leave you exhausted after a quick stint of gaming. But this can't hide the fact that it's hardly changed since the last Unreal outing. For every minute of the game our thoughts lay with The Orange Box, Call of Duty 4, Quake Wars and Battlefield 2142, which provide much more depth and enjoyment. *Emil Larsen*

Verdict

Overall Lightning-fast action gaming that looks great, but not enough servers or a decent single player to compete with the best first-person shooters

Overall ★★★☆☆

Price £34.99

Contact Epic Games
www.epicgames.com

System requirements 2.8GHz Pentium 4 or better • 512MB Ram • DVD-Rom drive • Nvidia Geforce 6200 or ATI Radeon 9600 or better • 8GB hard drive space

ADVENTURE GAME

Agon: The Lost Sword of Toledo

The Da Vinci Code meets Eldorado in this historical adventure game

The point-and-click adventure genre has made something of a minor resurgence in recent years, having languished in limbo since its mid-90s heyday. What with the return of Sam and Max as well as recently acclaimed Sherlock Holmes and Agatha Christie titles, adventure fans have been rather spoilt for choice of late. All of which only serves to highlight the many shortcomings of Agon: The Lost Sword of Toledo.

In Agon, you take on the role of the cleverly named historian Professor Samuel Hunt as he 'hunts' for clues to solving the mystery of the lost sword. The action takes place in early 20th Century Spain and involves a lot of clicking on people and objects to obtain information and investigate further.

Unusually for an adventure title, all the action takes place in the first person. You can't control your character in the way you would a normal first-person game, however. Instead, a series of different cursors appear on the screen depending on what you happen to be waving your mouse over. Clicking with an arrow cursor activated will move you forward, for example, while the cog icon means that there is some kind of action to perform.

It's a little annoying and you'll frequently find yourself clicking about the screen in frustration, particularly when it's not obvious what to do next. Puzzles are reasonably clever, but the majority of the game involves listening to reams of poorly delivered dialogue, which gets painful pretty quickly.

Visually, Agon is passable. You won't need a powerful PC to run the game but the top resolution available is only 800x600 pixels. The game's developers have gone for a non-realistic art style, with the characters looking vaguely Trumpton-like. *Jonathan Parkyn*

Verdict

Overall If you're desperate for an adventure game and have a high patience threshold, then you'd probably still be better off looking elsewhere

Overall ★★☆☆☆

Price £19.99

Contact Private Moon Studios
www.agongame.com

System requirements 1.7GHz processor • 512MB Ram • 1.5GB hard disk space • DVD-Rom drive • 32MB DirectX 9 graphics card • Windows 2000/XP/Vista

Best Buys

Your one-stop guide to the best-value products reviewed by PCW

With countless products available, shopping around for a new PC, peripheral or software package isn't an easy task, but with our Best Buys you can make a quick purchase with confidence. We've split our Best Buys into 40 of the most popular categories, covering everything from desktop and notebook PCs right through to digital cameras and software. Every month we update our Best Buys to include our most recent reviews and check the current pricing, although that's not to say you won't find a bargain online (try our price comparison site at **www.pcw.co.uk/bestprices**). You'll also find the date of the magazine in which the product was first reviewed, along with an alternative suggested product for that category.

If the Best Buy entry has a web code listed alongside it, it means you can read the full product review on our website. Simply head online and use the format **www.pcw.co.uk/[web code]** (for example **www.pcw.co.uk/2208243**).

Each Best Buy product has gone through our rigorous testing and reviewing procedures, making this your one-stop guide to the best products on the market.

BUDGET PC

Chillblast Fusion Sentinel
Price: £699
Reviewed: May 2008
www.chillblast.com
Web code: N/A
A well built, quiet PC with good all-round performance and enough space in the case for future upgrades. It features an overclocked Intel Core 2 Quad Q6600 processor and an Nvidia Geforce 8800GT graphics card.

ALTERNATIVE

Maxdata 300XS Mini PC
£589 www.pcwb.com Web code: N/A
An inconspicuous Vista PC with low power consumption and design that lets you attach it direct to the back of a monitor with a Vesa 100 mount.

HIGH-END PC

Ultraviolet Genesis XOC
Price: £4,464.93
Reviewed: April 2008
www.ultravioletmachines.com
Web code: N/A
The price may make your eyes water, but it doesn't get much faster than this. The QX6850 processor is overclocked to 3.5GHz while two EVGA 8800 graphics cards provide amazing 3D performance.

ALTERNATIVE

Alienware Area-51 7500
£2,368.80 www.alienware.co.uk Web code: N/A
Using an Intel Core 2 Duo QX6850 clocked at the standard 3GHz and SLI graphics, this PC notched up some impressive scores in our benchmarks.

BUDGET NOTEBOOK

Asus Eee PC 4G 701
Price: £220
Reviewed: March 2008
www.asus.com
Web code: 2206346
It's no speed demon, but the Eee PC from Asus is the cheapest laptop you'll find. It runs a Linux operating system, has easily upgradeable components and is incredibly small. At this price, it's an absolute steal.

ALTERNATIVE

HP Compaq 6715b
£586 www.hp.com Web code: N/A
With a 2GHz AMD Turion processor, 2GB of Ram, 160GB hard drive and 15.4in screen, this HP Compaq notebook is great value for money.

HIGH-END NOTEBOOK

Toshiba Satellite X200-219
Price: £1,399
Reviewed: April 2008
www.toshiba.co.uk
Web code: N/A
Thanks to its Core 2 Duo T7500, 320GB storage and pair of Nvidia Geforce 8600GT graphics cards, this is a superbly fast notebook. It comes with an HD DVD reader, great for watching high-definition movies.

ALTERNATIVE

Alienware Area-51 m9750
£2,487.48 www.alienware.co.uk Web code: N/A
With a 64GB solid-state drive, this Alienware notebook is no slouch. It also has two Nvidia Geforce 8700M graphics cards for fast gaming.

ULTRAPORTABLE NOTEBOOK

Lenovo Thinkpad X61
Price: £1,516
Reviewed: January 2008
www.lenovo.com/uk
Web code: 2199269
If you're looking for a notebook to take on long journeys the Thinkpad X61 is the one to go for. It features a great screen, excellent keyboard and long battery life.

ALTERNATIVE

Samsung Q45-A007
£799 www.samsung.com/uk Web code: N/A
It might not be the lightest notebook available, but at 2.3kg it certainly won't break your back and you'll be rewarded with excellent performance.

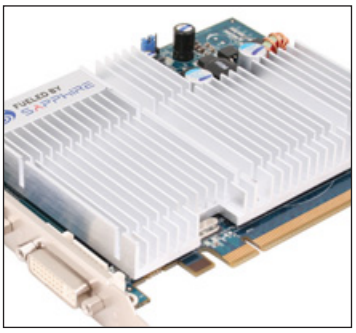
ULTRA-MOBILE PC

Samsung Q1 Ultra
Price: £799
Reviewed: October 2007
www.samsung.com/uk
Web code: 2193548
This update to the popular Q1 brings a Qwerty keyboard, faster processor and better battery life. It also has a high-quality screen, comes with Windows Vista Business and is one of the cheaper ultra-mobile PCs.

ALTERNATIVE

OQO Model E2 HSDPA
£1,369.11 www.oqo.com Web code: 2206509
Not as well designed as Samsung's Q1 Ultra, but the keyboard is bigger and it comes with an HSDPA Sim-card slot for high-speed mobile broadband.

BUDGET GRAPHICS CARD



Sapphire Radeon HD 2400 XT Silent
Price: £49.34
Reviewed: Christmas 2007
www.sapphiretech.com
Web code: N/A
A single-slot card with passive cooling makes this great for home theatre PCs. It can handle high-def movies, CPU usage is low, and DVI-HDMI and DVI-VGA dongles are included.

ALTERNATIVE

Asus EAH2400Pro
£32.89 http://uk.asus.com Web code: N/A
This card features low power consumption and, although not as fast as the Radeon HD 2400 Pro cards, it's cheap and has some impressive video capabilities.

HIGH-END GRAPHICS CARD

Foxconn FV-N88SMCD2-ONOC
Price: £195
Reviewed: Christmas 2007
www.foxconnchannel.com
Web code: N/A
You're getting a lot for your money with this 320MB card and the performance difference between this and the more expensive 640MB is slight. It comes with a USB joypad and a two-year warranty.

ALTERNATIVE

EVGA 8800 Ultra Superclocked
£487 www.evga.com Web code: N/A
An expensive choice, but it has excellent power usage and therefore more headroom for overclocking, which it uses to push the core clock speed to 612MHz.

TFT (17-22IN)

Philips 220WS8
Price: £189
Reviewed: February 2008
www.philips.co.uk
Web code: N/A
This 22in TFT screen has superb image quality, is evenly lit and, with a power draw of just 35W, it's also extremely efficient. The icing on the cake is Philips' excellent pixel policy. A great buy.

ALTERNATIVE

Viewsonic VX2255
£259 www.viewsoniceurope.com Web code: N/A
The VX2255's clear and excellent pixel policy along with its multimedia features mean it is great value at £259, despite the distinctly average image quality.

TFT (24IN+)

Samsung Syncmaster 245B
Price: £299
Reviewed: November 2007
www.samsung.com/uk
Web code: 2196900
Featuring accurate colours, a wide gamut and an adjustable stand, this Syncmaster 245B is a great-value 24in screen in a stylish chassis. It also houses VGA and DVI inputs, complete with HDCP support.

ALTERNATIVE

Hazro HZ26W
£576.82 www.hazro.co.uk Web code: 2202867
Although a little light on features, this is a high-quality S-IPS panel and excels both in terms of build quality and on-screen image quality.

PROJECTOR

Panasonic PT-AX200E
Price: £1,099
Reviewed: March 2008
www.panasonic.co.uk
Web code: N/A
Bright enough for general PC use and amazing with movies and games, Panasonic's PT-AX200E HD projector is a wise choice and comes with dual HDMI inputs along with excellent Game and Cinema presets.

ALTERNATIVE

Benq W500
£704 www.benq,co.uk Web code: N/A
At £700 the Benq is something of a bargain and makes for an ideal entry-level home projector and features 1080p/24 support.

SAT NAV

Tomtom Go 720
Price: £309
Reviewed: February 2008
www.tomtom.com
Web code: N/A
You're paying a bit more than you might for a number of perfectly capable rivals, but you get so much for your money with the Tomtom Go 720, including a customisable display and great performance on the road.

ALTERNATIVE

Mio 620t
£269 www.mio-tech.be Web code: N/A
Mio's new software is impressive and, considering the range of features, it's priced competitively. The maps look great and performance is equally good.

SMARTPHONE

02 XDA Stellar
Price: £From free
Reviewed: March 2008
www.o2.co.uk
Web code: 2207227
Available on a number of other networks (and Sim-free) this smartphone features a slide-out display, Qwerty keyboard, built-in GPS and Windows Mobile 6. The screen also tilts for easier typing.

ALTERNATIVE

Nokia E51
£From free www.nokia.co.uk Web code: 2200554
Marketed as a business phone but with Wifi, HSDPA and multimedia tools, such as an FM Radio, it's great for corporate and home users.

DIGITAL CAMERA

Fujifilm Finepix F50fd
Price: £229.99
Reviewed: January 2008
www.fujifilm.co.uk
Web code: 2203246
This camera features excellent build quality, a fast face detection tool and a dual-format card slot. It also takes great photos and is incredibly easy to use, making it perfect for amateur and experienced photographers alike.

ALTERNATIVE

Ricoh GR Digital II
£399.99 www.ricoh.co.uk Web code: N/A
This digicam doesn't have an optical zoom or other fancy features. Instead it concentrates on image quality – and does a great job.

PORTABLE MEDIA PLAYER

Sony NWZ-A815
Price: £89
Reviewed: January 2008
www.sony.co.uk
Web code: 2203060
It might lack some of the extra features found in other media players, but this Sony model excels in terms of audio quality and is easy to navigate. It also comes with a decent set of headphones.

ALTERNATIVE

Apple iPod Nano
£129 www.apple.com/uk Web code: 2199118
An astonishing design that produces good-quality video and audio. It also benefits from excellent battery life.

MEDIA STREAMER

Archos TV+
Price: £249
Reviewed: May 2008
www.archos.com
Web code: n/a
With a 250GB hard drive, this device not only streams media across your network, but will also store content for retrieval. It's also a PVR, features a Qwerty remote control and has optional web browsing.

ALTERNATIVE

Linksys DMA2200
£229 www.linksys.com Web code: 2208886
This Media Center extender will stream movies, music and photos from your PC with the minimum of fuss.

LASER PRINTER

Brother HL-2170W
Price: £149
Reviewed: March 2008
www.brother.co.uk
Web code: 2207225
If you're looking for a good-quality mono laser printer for general home use, this Brother model is definitely worth considering. It's fast, compact and even has a wireless adapter. A bargain at this price.

ALTERNATIVE

Lexmark X500n
£301 www.lexmark.co.uk Web code: N/A
An amazingly good-value laser considering it's not only colour but also includes a scanner allowing you to scan, copy and print at speed.

PHOTO PRINTER

Canon Selphy CP750
Price: £110
Reviewed: October 2007
www.canon.co.uk
Web code: 2193769
It's a little bulky when in use, but this dedicated photo printer can produce high-quality prints in less than 70 seconds. A 2.4in display lets you perform basic image editing before printing.

ALTERNATIVE

Sony DPP-FP90
£150 www.sony.co.uk Web code: 2196751
It's not particularly cheap to run, but this printer produces high-quality photos from a variety of sources and is reasonably fast as well.

MULTIFUNCTION PRINTER

HP Photosmart C7280
Price: £249
Reviewed: May 2008
www.hp.com/uk
Web code: n/a
Aimed mainly at home office users who need both a fax and great photo printing. Combine this with high quality printing, scanning and copying and you've an impressive piece of kit on your hands.

ALTERNATIVE

Kodak Easyshare 5500
£199 www.kodak.co.uk Web code: 219926
This multifunction device features decent print, copy and scan functions, but it's big draw is the low running costs.

NETWORK-ATTACHED STORAGE

Qnap TS-209
Price: £254
Reviewed: Christmas 2007
www.qnap.com
Web code: 2200223
If you're after a Nas device that does more than just share files over your network, this is it. You can schedule Bit Torrent downloads, stream media to UPnP devices and install your own drives in it.

ALTERNATIVE

Acer Aspire Easystore
£499 www.acer.co.uk Web code: 2206105
This Nas device features 2TB of storage (other sizes are available) along with wireless so you can place it anywhere in your home.

POWERLINE NETWORKING

Solwise NET-PL-200AV Push
Price: £50
Reviewed: March 2008
www.solwise.co.uk
Web code: 2207035
You'll need at least two of these to get your powerline network running, but they're the best around. Based on the Homeplug AV standard they're fast, resilient to electrical noise and great value for money.

ALTERNATIVE

Devolo Dlan 200 AV
£149 www.devolo.co.uk Web code: N/A
Small and well designed, these Devolo powerline devices use the Homeplug AV standard and have pre-programmed Quality of Service rules built in.

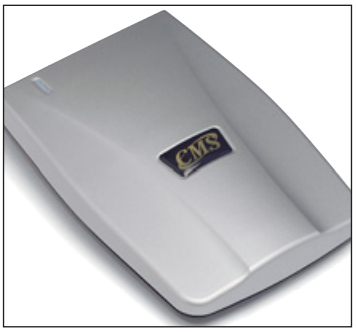
WIRELESS ROUTER

Linksys WAG325N
Price: £99.99
Reviewed: May 2008
www.linksys.com
Web code: n/a
It might look a little unconventional, but this Draft-N router from Linksys performs extremely well. It also features some sophisticated tools including VPN support and the option of creating virtual wireless networks.

ALTERNATIVE

Solwise Engenius Wireless-N Gigabit Router
£120 www.solwise.co.uk Web code: n/a
It might be a little pricey, but this router performed well in our tests and comes complete with some advanced network filtering tools.

EXTERNAL HARD DRIVE



CMS V2ABS-CE-120
Price: £175
Reviewed: Christmas 2007
www.cmsproducts.com
Web code: 2202396
A portable USB2 external hard drive that weighs a mere 150g and comes with built-in 256-bit AES encryption. Inside the case sits a 2.5in 120GB 5,400rpm Sata notebook drive.

ALTERNATIVE

Western Digital Mybook Studio
£204 www.westerndigital.com Web code: 2206075
This stylish 1TB external drive comes with USB2, Firewire 800/400 and eSata interfaces for ultimate flexibility.

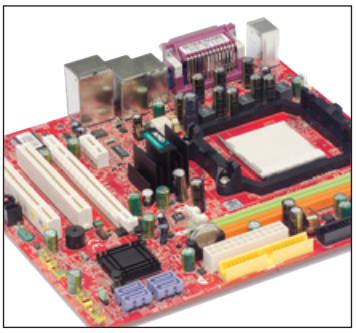
INTERNAL HARD DRIVE

Western Digital WD10EACS
Price: £185
Reviewed: January 2008
www.westerndigital.com
Web code: 2203061
This drive features four 250GB platters to provide 1TB of storage. It includes some advanced technology such as Intelliseek, which calculates optimum seek speeds to lower noise, vibration and power usage

ALTERNATIVE

Toshiba MK2035GSS
£79 www.toshiba.co.uk Web code: 2203064
Weighing just 98g this 200GB 2.5in Sata hard drive is perfect for increasing the storage capacity of your notebook.

AMD MOTHERBOARD



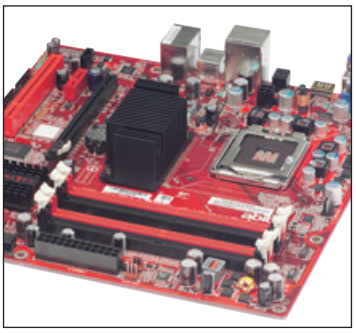
MSI K9AGM2-FIH
Price: £45
Reviewed: February 2008
www.msicomputer.com
Web code: N/A
Although it won't suit overclockers and has limited upgrade potential, this Micro-ATX AMD motherboard is perfect for home theatre PCs. It supports all AMD's AM2 processors and comes with an HDMI port.

ALTERNATIVE

EQS AB1S-RS690MKM
£46 www.eqscomputers.com Web code: 2204803
The cramped design limits upgrade potential, but it's a keenly priced AMD motherboard that features an onboard HDMI port for HD video.

INTEL MOTHERBOARD

Abit Fatal1ty F-190HD
Price: £68
Reviewed: February 2008
www.abit.com.tw
Web code: 2204480
A stable Intel motherboard that's passively cooled and therefore ideal for home theatre PCs. It also features an HDMI socket for HD video and has decent overclocking potential if used as part of a gaming PC.



ALTERNATIVE

Gigabyte GA-G31MX-S2
£53 www.giga-byte.com Web code: 2202711
Considering the price, you get plenty of features on this Intel board including Intel's G31 Express chipset and ICH7 Southbridge.

PC CASE

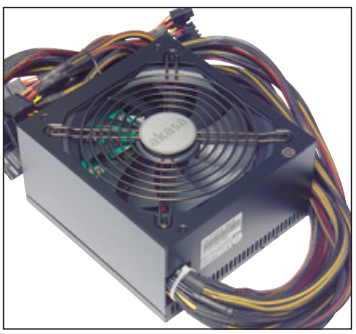
Akasa Eclipse-62 V2
Price: £92.38
Reviewed: May 2008
www.akasa.co.uk
Web code: N/A
It might not have the flashy design of some cases, but with the whole case, including the roof, able to come apart, along with its easily-removable motherboard plate, it's the ideal chassis enthusiasts and modders alike

ALTERNATIVE

Coolermaster Cosmos 1010
£139.83 www.coolermaster.com Web code: n/a
Thanks to its extra-large design, this case not only looks impressive but is also very easy to work on and comes complete with temperature probes.

POWER SUPPLY

Akasa Powermax 1000
Price: £135.11
Reviewed: March 2008
www.akasa.co.uk
Web code: 2207736
This 1,000W power supply has two +12V rails and the single 135mm dual-ball bearing fan makes it a lot quieter than you would expect. It comes with a variety of power connectors.



ALTERNATIVE

Enermax Galaxy 1000W
£233.83 www.enermax.com.tw Web code: 2164011
The 1,000W Enermax Galaxy power supply will suit those with SLI graphics and other power-sapping components, but it comes at a fairly high price.

OFFICE SUITE

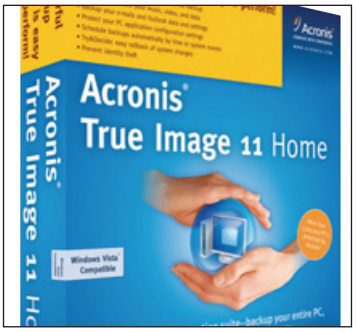
Microsoft Office 2007
Price: £357
Reviewed: May 2007
www.microsoft.com
Web code: 2183475
The new interface to Office is something you'll either like or loathe – we like it, but upgrading comes at a price, both in cash and in effort. Despite this, it's still the leader in office productivity software.

ALTERNATIVE

Corel Wordperfect X3
£276 www.corel.co.uk Web code: 2149856
This latest version of Corel's office suite includes tools such as PDF exporting along with improved compatibility with other office applications.

SYSTEM UTILITY

Acronis True Image 11
Price: £39.99
Reviewed: April 2008
www.acronis.co.uk
Web code: N/A
True Image 11 is an excellent backup and recovery solution that offers an unprecedented level of control over disk cloning, scheduled backups and secure file deletion. And, despite the range of features, it's easy to use.



ALTERNATIVE

Paragon Hard Disk Manager
£29.99 www.paragon-software.com Web code: 2205339
A comprehensive, all-in-one suite of hard disk maintenance and backup tools that's easy to get to grips with and comes at a good price.

IMAGE EDITING

Anthropics Portrait Professional 6
Price: £29.95
Reviewed: November 2007
www.portraitprofessional.com
Web code: 2197168
Achieve magazine cover-quality portraits by marking out key points and moving slider controls. Don't let the low price fool you, this is a powerful piece of software.

ALTERNATIVE

Apple Aperture 2
£129 www.apple.com/uk Web code: 2210481
Apple's image management software moves faster, looks leaner, and has better adjustment tools. It's also significantly cheaper than pervious versions.

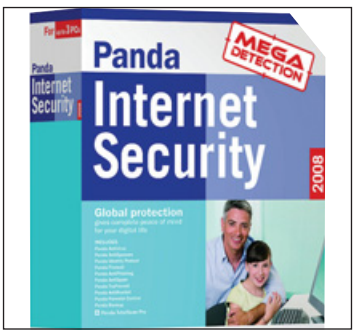
VIDEO EDITING

Pinnacle Studio 11 Ultimate
Price: £89.99
Reviewed: November 2007
www.pinnaclesys.com
Web code: N/A
This video-editing package is well designed and has powerful video tools, advanced audio tweaking and an easy-to-use interface. A standard version, without the high-definition features, is available for £39.

ALTERNATIVE

Cyberlink Powerdirector 6
£49.99 www.cyberlink.com Web code: N/A
Although this budget video-editing suite lacks advanced editing tools, it's incredibly easy to use and is attractively priced.

PC SECURITY



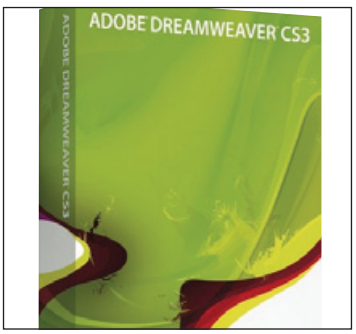
Panda Internet Security 2008
Price: £42.99
Reviewed: January 2008
www.pandasecurity.com
Web code: N/A
A feature-packed internet security suite with fast anti-virus and spyware detection tools, including heuristic scanning. It also has fast scan times and a decent firewall, along with backup and PC optimisation features.

ALTERNATIVE

Agnitum Outpost Pro Security Suite 2008
£30.80 www.agnitum.com Web code: 2204511
Outpost offers solid protection at a competitive price with fast scanning and a quality firewall, though it does lack some extras found in rival suites.

WEB DESIGN

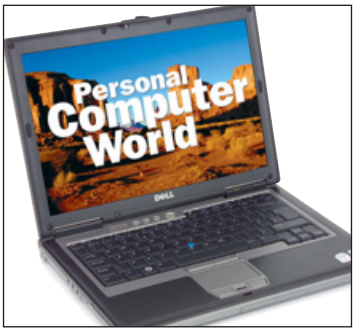
Adobe Dreamweaver CS3
Price: £393
Reviewed: July 2007
www.adobe.com
Web code: 2186591
Powerful HTML coding and design tools along with CSS templates and Ajax widgets to help non-programmers get started. There's also a big emphasis on CSS, including a CSS Advisor tool for newcomers.



ALTERNATIVE

Microsoft Expression Web
£260 www.microsoft.com Web code: 2185242
Expression Web is a very good web-editing suite if you accept the inevitable Microsoft bias, featuring CSS support and a powerful interface.

BUSINESS PC



Dell Latitude D531
Price: £586
Reviewed: October 2007
www.dell.com
Web code: N/A
With a dual-core AMD Turion processor clocked at 1.8GHz, 2GB of Ram and Vista Business, this is a good budget model. It also features a built-in DVD writer, 120GB Sata hard disk and both Wifi and Bluetooth.

ALTERNATIVE

HP Compaq dc7800
£598 www.hp.co.uk Web code: 2207533
The space-saving design of this affordable business desktop is very compelling and it can attach directly to an optional HP TFT screen.

BUSINESS PRINTER

HP Color Laserjet CP3505x
Price: £579
Reviewed: January 2008
www.hp.com
Web code: N/A
This laser printer has the performance and capacity required to handle the printing needs of most small businesses. It's also fast, has a 65,000 pages per month duty cycle and includes wired Lan connectivity.

ALTERNATIVE

Zebra P100i
£1,245.50 www.zebracard.com Web code: N/A
A great device for small businesses needing to print plastic cards in volume. It takes up little desk space and is able to print in full colour.

NETWORK SECURITY

Smoothwall Smoothguard 1000-UTM
Price: £3,231.25
Reviewed: September 2007
www.smoothwall.net
Web code: 2194393
A comprehensive array of security tools, load balancing and failover facilities and extensive reporting options, mean this network security device justifies the high price.

ALTERNATIVE

Webroot Antispyware Corporate
£22.56 www.webroot.com Web code: N/A
At this price you get a one-year licence for 10 users, which is great value. It also covers two key client security bases in one go.

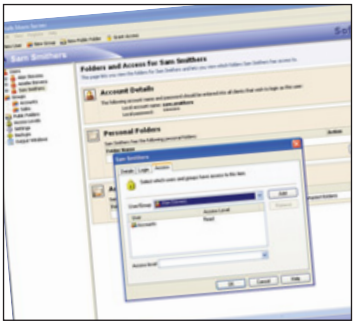
NETWORK MANAGEMENT

1E Nightwatchman
Price: £14.10
Reviewed: March 2008
www.1e.com
Web code: N/A
This piece of software costs very little but could save you a lot. Using simple command-line controls, it will close applications on the PCs on your network and then shut the machines down to cut your energy bills.

ALTERNATIVE

Prefix IT PrefixNE
£Up to 2.94 per PC per month www.prefixit.com Web code: 2205651
Easy to install and use, this network management application lets you keep track of all the kit on your network and is perfect for small businesses.

COLLABORATION SOFTWARE



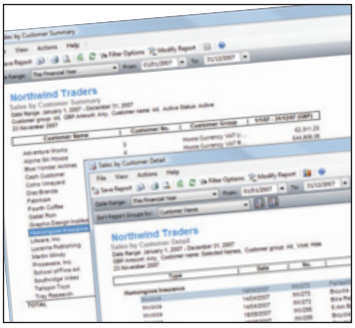
Softalk Share Server
Price: £175
Reviewed: December 2007
www.softalkltd.com
Web code: 2202379
A good software package for small companies wanting to share Outlook folders without the expense and complexity of an Exchange server. There are minimal hardware requirements and it's simple to install.

ALTERNATIVE

C2C Archive One Policy Manager
£40 www.c2c.com Web code: N/A
This is a well conceived and easy-to-implement Exchange storage management tool that can enhance performance and even reduce costs.

BUSINESS ACCOUNTS SOFTWARE

Microsoft Accounting 2008
Price: £149
Reviewed: February 2008
www.samsung.co.uk
Web code: 2207529
A late entrant to the UK accounting market, Office Accounting 2008 is easy to use, feature-rich and will shake up the competition. It also offers in-depth integration with Outlook 2007 Business Contact Manager.



ALTERNATIVE

Intuit Quickbooks Pro 2008
£299 www.quickbooks.co.uk Web code: 2203178
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Personal Computer World

How we test

Performance testing is an important part of *PCW*'s reviewing process, and to obtain our authoritative results we use the UK's best PC testing resource. Here we explain why you can trust our results and give you a tour of our most frequently used benchmark programs

At the core of our PC performance tests are industry-standard benchmarks from Bapco and Futuremark. Sysmark 2007 Preview is the latest Vista-compatible version in a long line of Bapco benchmarks and it allows us, for the first time, to compare the application performance of Windows XP and Windows Vista-based systems with the same benchmark. It tests real-world application performance by running a series of scripts to mimic authentic user tasks. It loads and runs full versions of 14 market-leading applications, which are:

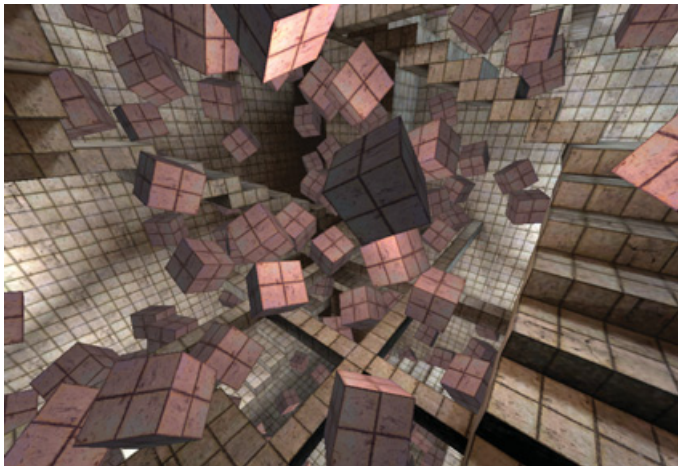
- Adobe After Effects 7
- Adobe Illustrator CS2
- Sketchup 5
- Adobe Photoshop CS2
- Autodesk 3ds Max 8
- Sony Vegas 7
- Macromedia Flash 8
- Microsoft Excel 2003
- Winzip 10
- Microsoft Outlook 2003
- Microsoft Powerpoint 2003
- Microsoft Word 2003
- Microsoft Project 2003
- Microsoft Windows Media Encoder 9 series

Note that scores from Sysmark 2007 Preview are not comparable to scores from previous versions of Sysmark. All scores are relative to the Sysmark reference machine, which scores 100 (see below for details).

In *PCW's* labs, our staff have over 20 years of combined testing experience. We know all the perils and pitfalls of practical benchmarking, and we contribute to the development of industry-standard benchmarks through our full membership of Bapco (**www.bapco.com**), the non-profit benchmark consortium. Listed below are the main benchmarks we use for testing PC systems and components.

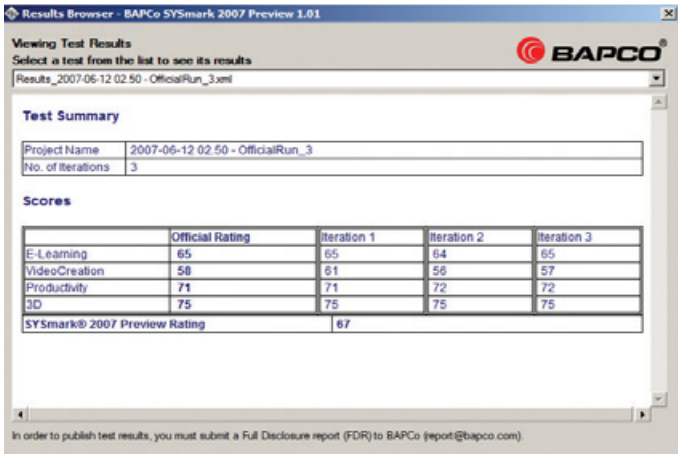
- Bapco Sysmark 2007 Preview – an application-based benchmark that tests real-world system performance.
- Futuremark 3Dmark06 – the latest version of 3Dmark that tests DirectX 3D graphics performance.
- Games – we use built-in benchmarks in Far Cry and Fear to see how graphics cards perform in a real-world games.
- Futuremark PCmark05 – a synthetic benchmark used to test the performance of a PC's major subsystems.
- Test beds – we use standardised AMD and Intel-based test rigs to test components and peripherals.

There's more information about our testing procedures and benchmarks on our Labs site at **www.reportlabs.com/testbed/bguides/benchmarks.php**.



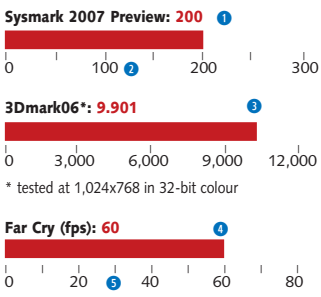
PCmark05 measures memory, processor, graphics and hard drive performance

3Dmark06 is used to test 3D graphics performance



Sysmark 2007 Preview tests real-world performance using common apps

Performance



❶ A score of 200 indicates that the system is twice as fast as the reference PC.

❷ The reference PC (Intel Core 2 Duo E6300 1.8GHz, 1GB Ram) scores 100.

❸ An Nvidia Geforce 8600GT would score in the region of 9,900.

❹ Fear: A score of 60fps (frames per second) or higher is most desirable.

❺ A result of 30fps or above means the machine can produce playable frame rates at the tested resolution.

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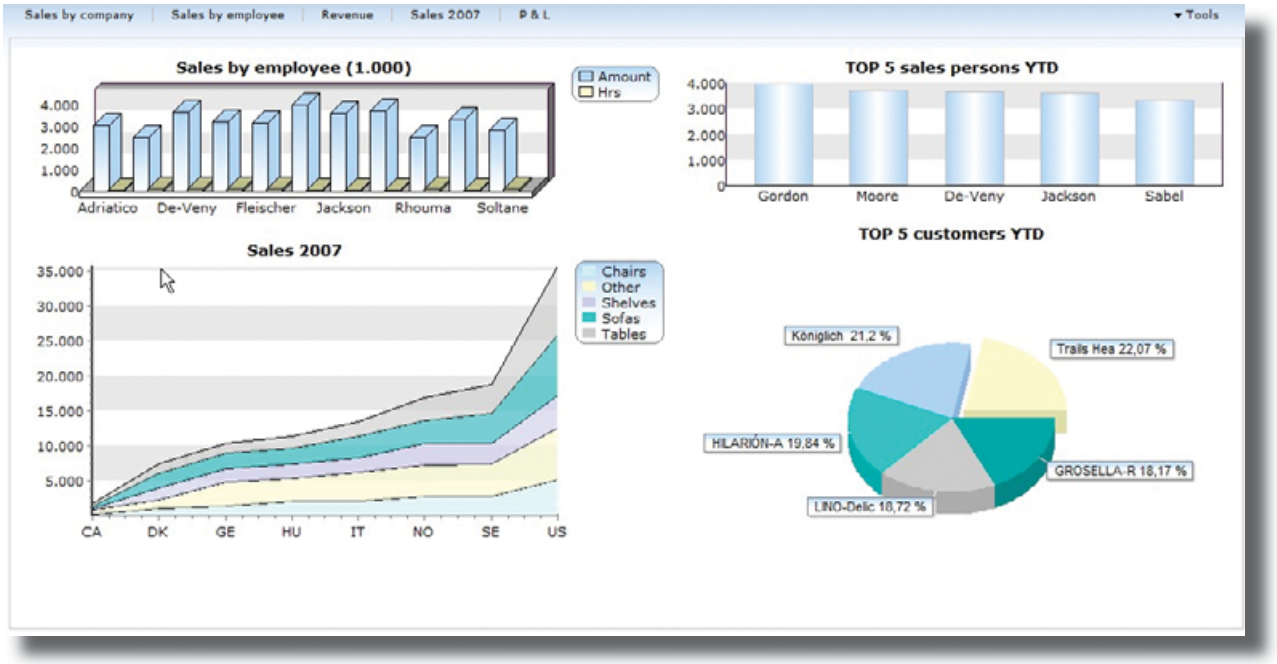

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Grand designs

We asked manufacturers to submit a full-featured notebook for less than £1,000. Emil Larsen put each one through its paces

The success Asus has had in selling its £200 notebook, the Eee PC, reflects the perpetual price drops in modern computing technology.

The Eee PC is stymied by a small screen and cramped keyboard, which means it's not suited to everyone. More expensive notebooks have stronger construction, faster components and such features as hybrid hard disks, top graphics cards or high-resolution screens.

We invited every major manufacturer in the UK to submit a notebook costing no more than £999 including Vat. We had no other requirements, leaving it up to manufacturers to submit their best model at this price point. The result was 12 notebooks, each put through a barrage of benchmarks and physical tests.

Last month we looked at three very high-end laptops and realised, not for the first time, that there were massive differences between the brightness of their screens. Every LCD varies enormously in terms of the colours they can display and their native colour temperature – even with identical models from the same manufacturer. But some laptops consistently come with dimmer LCDs than the rest. With our suspicion aroused, we set out to show the vast difference between the laptops you can buy.

On another note, we also deliver the definitive word on whether Apple's hardware is any good when placed alongside the vast swathes of Microsoft-loving manufacturers.

ON TEST

90 Acer Aspire 7720 Gamers
Apple Macbook
91 Asus M50SV-AS027C
Cyberpower X5-C90
92 Fujitsu Siemens Esprimo Mobile U9200
Gigabyte W566N
93 Lenovo T61 UZ26DUK
Mesh GX700
94 Rock Pegasus 710
Samsung X22
95 Toshiba Satellite P200-1K9
Zoostorm 4-6641 Ultimate
96 Performance results
98 Table of features
100 Dissecting the Acer Aspire 7720G
101 Editor's Choice

'We invited every major manufacturer in the UK to submit a notebook costing less than £999'

Acer Aspire 7720 Gamers

Price £999 **Contact** Play.com 0845 800 1020 www.play.com

Acer hired BMW Designworks to create the chassis for its Gemstone Aspire laptops and, as we've said before, we think the result is distinctly ugly. It's not just looks that fail this 7720, though, since the keyboard flexes a little as you type. The trackpad is also flush with the chassis rather than sunk into it, which means your wrists continually tamper with it as you type, moving the cursor about and sending your prose everywhere.

If you can live this, or type with your wrists in the air like you're playing the piano, the 7720 has some excellent features; the most impressive of which is the 1,920x1,200 resolution 17in screen. It's incredibly detailed and ticks that all-important 1080p box for high-definition content. An HD DVD reader (which will also write to DVDs) is included for HD content, although HD DVD is on its last legs.

Inside, Acer has included some of the fastest components to grace this group, including a Core 2 Duo T7700 processor and a Geforce 8600GT graphics card. The inclusion of 3GB of Ram may appear unusual, but this amount is used in three other notebooks in this group test. Since 3GB is achieved by pairing 1GB and 2GB sticks together, the benefit of dual-channel memory is lost. Identical Dimm pairs double data throughput from Ram to the memory controller, so 2GB or 4GB would be best, but 4GB goes to waste on a 32-bit Windows system since, at best, only 3.3GB is available. That said, we measured no performance increase when we enabled dual-channel memory by going from 3GB to 2GB in any of our benchmarks.

The Dolby-certified speakers are powerful and have plenty of bass, while the excellent screen ensures it's a top choice for movie lovers, and the Aspire 7720 Gamers is a worthy winner our Editor's Choice award.

Personal Computer World EDITOR'S CHOICE

Verdict

Pros Great system performance; excellent screen; good speakers

Cons Chunky; ugly chassis; poor trackpad and battery life

Overall A superb screen and a wide range of features mean that it's the best of the bunch, even if it needs an external mouse for work purposes

Features	★★★★☆
Performance	★★★★★
Value for money	★★★★★
Overall	★★★★★

Apple Macbook

Price £829 **Contact** Apple 0800 048 0408 www.apple.com/uk

Love or hate the operating system, it's difficult not to be enticed by the superb design of Apple's hardware. The Macbook is 7mm slimmer than the next thinnest notebook here (Lenovo's T61), but its rubbery chassis remains sturdy. It also beats the competition with its trackpad size – with an 11cm diagonal it completely dwarfs Lenovo's 6.5cm version. But its downside remains the single mouse button, which is a pain if you install Windows.

The Macbook's stylish keyboard is comfortable to use and, unlike some other notebooks, neighbouring keys move completely independent of each other.

Apple's patents ensure its excellent Magsafe power adapter is unique to its laptops. The power adapter has a magnetic rim, allowing it to detach safely if somebody trips over the power cord.

This notebook is thin on ports, though. There's no card reader, just two USB ports and Apple relies on a space-saving Mini-DVI connector to hook up external displays, which is of no use unless you buy a £15 Mini-DVI to DVI adapter.

The hinge of the notebook hides two tinny, yet loud speakers, and media playback is eased by the inclusion of a sleek remote control.

Like all new Macs, the Macbook is based on regular x86 Intel components. That meant we could install Windows natively and get a true measure of its performance compared with the rest. It took 40 minutes to install Vista Home Premium alongside Mac OSX. The PCmark05 result was lacklustre, since just 1GB of Ram is included, hogging both expansion slots, and poor performing integrated graphics are used.

With very good battery life, a bright 13.3in screen and a small footprint – it has the smallest volume on test – the Apple Macbook is a top notebook.

Personal Computer World RECOMMENDED

Verdict

Pros Magnetic power plug; slim chassis; large trackpad; good battery life

Cons Single mouse click; dongle needed for video output

Overall A superb chassis and some unique features make it a tempting choice, but it's not perfect

Features	★★★★★
Performance	★★★☆☆
Value for money	★★★★☆
Overall	★★★★☆

Asus M50SV-AS027C

Price £899 **Contact** Asus 020 7631 2020 http://uk.asus.com

An auto light sensor is a top selling point of Asus' new M50SV chassis. It dims the display's backlight when the notebook is placed in a dark environment to extend battery life and brightens the LCD when surroundings are bright to improve visibility.

A less obvious innovation lies with one of the M50SV's USB ports, which doubles up as an eSata port. It would be great to see all notebooks have this kind of simple, but space-saving dual-purpose port.

There are lots of other goodies to play with too, including 1GB of Turbo Flash memory, a bag, mouse and fingerprint reader.

The chassis is solid throughout, although the keyboard rattles as you type, making it the noisiest on test, but the accurate trackpad is impressive. It transforms into a touchpad with media shortcuts on request but, like the trackpads on some Toshiba notebooks, it's not easy to use in media-button mode.

Asus has Dolby Home Theater branding for the M50SV, like Acer and Mesh do for their notebooks. A Dolby badge guarantees that a Dolby-optimised driver has been installed for the integrated Realtek HD audio chip. However, in Asus' case, the speakers are mediocre compared with the best.

This is the first notebook we've seen with an Nvidia Geforce 9500M GS graphics card. Its 32 stream processors are identical to the Geforce 8600M GT's, but 3D performance was at the top of the pile. The Geforce 9500M GS also brings lower CPU utilisation during HD playback and is built using more energy-efficient 65nm building blocks.

Performance was good across the board and, although the M50SV doesn't have the style of the Macbook, it is good value at £899.

Verdict

Pros Solid chassis; good CPU performance; cheaper than most
Cons Dull speakers; keyboard can rattle a little; media pad is fiddly
Overall Lots of goodies to play with and reasonable performance all round

Features	★★★★☆
Performance	★★★★☆
Value for money	★★★★★
Overall	★★★★☆

Cyberpower X5-C90

Price £999 **Contact** Cyberpower 0800 019 0863 www.cyberpowersystem.co.uk

Cyberpower's X5-C90 uses an Asus C90S chassis that is touted as one of the first user upgradeable laptops. In fact, most of these laptops are easy to upgrade – a screwdriver is usually all that's required to access the innards.

The X5-C90 differs from the rest by using a desktop socket (775) and processor – the Core 2 Duo E6600. It's a cheaper 2.4GHz chip than its mobile T7700 sibling with identical processing performance, but resulted in the X5-C90 being a hungry laptop during testing.

While the chassis got very warm, the power supply was almost too hot, reflected by the sky-high energy consumption which was double the rest of the pack.

The X5-C90 has an astonishing exhaust system that adds 3.5cm in depth on its backside. This 'Turbo Engine'-branded cooler contains heatsinks and four fans, which kept the notebook stable through a week's worth of testing.

Shiny mouse buttons sandwiching a fingerprint reader grab your attention on the outside. The trackpad does a good job of office work, although there's a small amount of rattle to the keyboard that is not as prevalent as the Asus M50SV.

A large bezel frames the brightest and one of the most vivid displays on test. Its 1,680x1,050 resolution is perfectly detailed for a 15.4in notebook. Cyberpower also includes a fast 7,200rpm 120GB hard disk.

The two speakers included were distinctly average in our sound tests, dulled by the fact that they are angled towards the surface the notebook sits on.

Battery life was poor, but enthusiasts will love the easy access to the two PCI Express Mini slots included and the ability to upgrade to faster desktop chips – though the 945G chipset won't accept new 45nm CPUs.

Verdict

Pros Fast hard drive performance; fantastic screen
Cons Very warm chassis; high power draw; bulky exhaust
Overall Good performance and an excellent screen but we'd not like to live with this scorching desktop-based notebook

Features	★★★★★
Performance	★★★☆☆
Value for money	★★★☆☆
Overall	★★★☆☆

Fujitsu Siemens Esprimo Mobile U9200

Price £950.58 **Contact** Fujitsu Siemens 0845 678 0172 www.fujitsu-siemens.co.uk

This Esprimo Mobile U9200's Core 2 Duo T7500, 2GB of Ram and 120GB hard disk make mincemeat of office tasks. It has Intel's X3100 integrated graphics too, so its basic specs are almost identical to the Macbook. However, the U9200 has a smaller screen (12.1in compared to Apple's 13.3in) and weighs 200g less.

The U9200 excels by being a truly mobile office since it includes an unlocked HSDPA module. All you need to do is pop a 3G Sim card into the slot beneath the battery and you're away.

The U9200 is capable of up to 3.6Mbits/sec download speeds with the right service provider, although this also depends on coverage in your area. With various mobile operators now offering low-cost unlimited data access it gives this Fujitsu Siemens an edge over the competition.

Otherwise the U9200 is a rather bland portable laptop. Its grey plastic chassis is 1cm thicker than the Macbook's. It's also by no means sexy, but it is reasonably affordable for a business runaround.

The small trackpad is articulate but has some rather stiff mouse buttons and, although crisp, the keyboard remains one step behind Lenovo's keyboards.

Thanks to its reflective coating, the screen has very good viewing angles and it is bright. The screen sits near the bottom of the pile in our contrast ratio tests. Although this is one of the areas that isn't so important for most notebook users, our tests indicate just how far behind notebooks are from modern desktop LCDs (most of which achieve contrast ratios of 500:1 or better).

The U9200's 5,200mAh battery lasted just short of three hours in Mobilemark's Reader test and over two hours playing back a DVD – a good result compared to the other models on test.

Verdict

Pros Unlocked; integrated HSDPA module; good battery life

Cons Bland and thick chassis; integrated graphics; stiff trackpad buttons

Overall The Esprimo U9200 is one of the best HSDPA notebooks but is a little bulky for a 12.1in notebook

Features	★★★★☆
Performance	★★★☆☆
Value for money	★★★☆☆
Overall	★★★☆☆

Gigabyte W566N

Price £774.81 **Contact** Expansys 0161 868 0868 www.expansys.com

Gigabyte's W566N is one of the lightest 15.4in notebooks we've ever tested, tipping the scales to 2.7kg (3.3kg with the power adapter). The chassis leans forward to a slim front measuring just 32mm when closed and, combined with a grey and black styling, it looks rather understated alongside the other notebooks.

The speckled black LCD backing has a thin bezel that frames the screen, but the display's hinge doesn't let it lean backwards as much as other notebooks, so you can't use the notebook standing up, for example.

Inside, its Core 2 Duo T7250, 2GB of Ram and a 160GB hard disk performed well alongside the other notebooks, despite the W566N being £225 under budget. Battery life was good in our PDF reader test where it lasted lasting two hours, 11 minutes.

Cuts have been made in the graphics department; the Geforce 8400M GS is a long way behind Geforce 8600M and Radeon 2600 cards for playing modern games, but the 8400M is vastly superior to Intel's integrated graphics and makes playing older games viable at the W566N's native 1,280x800 resolution.

We have some concerns over the W566N's build quality. The trackpad is slightly restrictive and joined by a large keyboard that was the worst on test; it has a fair amount of flex and makes a rattling noise as you type. Listening to music was also a poor experience since the speakers were flat and dull.

Another nail in the construction coffin lay with the power adapter port on the laptop. The lead and plug on our sample didn't fit together well and required a firm push, although Gigabyte said this wouldn't be the case with retail units.

If you're in the market for a 15.4in laptop, and can live with its niggles, the W556N is a reasonable choice.

Verdict

Pros Cheap; reasonable battery life; lightest 15.4in laptop

Cons Poor power adapter fittings; keyboard flex and rattle; flat speakers

Overall Good performance and cheaper than the rest, but the chassis has several flaws

Features	★★☆☆☆
Performance	★★★☆☆
Value for money	★★★★☆
Overall	★★★☆☆

Lenovo T61 UZ26DUK

Price £1,022 **Contact** Lenovo 0800 169 1451 www.lenovo.co.uk

From a physical design point of view, Lenovo's laptops haven't changed that much over the years (even when they were IBM models) and the T61 continues the tradition of coming last in any beauty contest it enters. Although it's relatively sturdy, we did notice some chassis bend where your wrists sit, which was never the case with Thinkpads of the past.

Its black chassis is devoid of a webcam and card reader, but does include an LED that illuminates the keyboard in dark conditions. The T61's keys are large, have lots of travel, produce a crisp response and there's no flex across the keyboard when forced.

System performance wasn't top, but it took gold medal in the Mobilemark Reader test by lasting a full three hours before switching off.

The 14.1in screen has a 4:3 aspect ratio rather than a more common 16:10 ratio, which gives six per cent more viewable area than a widescreen with the same diagonal measurement. So, unless you're going to squeeze documents side by side (unlikely on a small notebook) or use it for films, sticking with a non-widescreen display isn't such a bad idea.

Its 1,024x768 resolution is a disappointment for this day and age. Some may appreciate the large pixels, but most will see it as rather blocky compared to higher resolution 14in notebooks.

Lenovo, like Asus and Gigabyte, includes a TPM 1.2 chip which, with the right software, offers much stronger security than Windows offers by storing passwords in a discrete hardware chip.

The lack of Draft-N Wifi is disappointing, as are the tinny speakers. Although the suggested retail price is £20 over budget, this model is available for less and its superb battery life and a generous three-year warranty make it a top choice for business users on the move.

Verdict

Pros Excellent keyboard; excellent battery life

Cons Short on Ram; integrated graphics; low resolution for 14.1in laptop

Overall Well suited as a low-resolution but powerful business travelling companion

Features	★★★★☆
Performance	★★★★☆
Value for money	★★★☆☆
Overall	★★★★☆

Mesh GX700

Price £999 **Contact** Mesh 08447 360 440 www.meshcomputers.com

Mesh's GX700 takes the honour of being the most compact 17in notebook in this group. The overall footprint of the GX700 is even smaller than Cyberpower's and Asus' 15.4in notebooks.

The screen's 1,680x1,080 resolution is enough to squeeze two documents side by side. It is a little dim, coming second to last when we used our Spyder3Elite to measure brightness. However, it was clear and we measured a strong contrast ratio from the panel.

MSI builds the chassis, which certainly isn't the trendiest design about and is prone to fingerprints. It does have a reassuringly tough LCD hinge and is more attractive than Acer's offering, though.

Stiff trackpad buttons mean it's not the best notebook to work on, but the external mouse included offers relief. The keyboard, too, has a very cramped layout on its right side, with the Shift, forward slash and arrow keys minuscule and easy to miss. Like all the 17in notebooks here there's a separate number pad.

We're blown over by Toshiba's notebook speakers every time we test them, but MSI's four-speaker setup with subwoofer aren't far off.

The GX700 is all Santa Rosa inside. Its Core 2 Duo T7250 is an 800MHz FSB (front-side bus) chip running at 2GHz but has half the L2 cache (2MB instead of 4MB) compared with the 2.4GHz chips in the Acer and Toshiba notebooks. That meant it fell to the bottom end of our Cinebench and PCmark05 CPU rankings.

Its Geforce 8600M GT graphics achieved decent results in our 3D benchmarks, but even though it reaps the benefit of dual-channel memory – a perfectly matched pair of 667MHz Dimms – it still falls behind others with 3GB single-channel Ram setups, leaving the GX700 looking rather average alongside our winners.

Verdict

Pros Detailed screen; decent graphics; relatively compact for a 17in notebook

Cons Stiff mouse clicks; cramped right keyboard layout

Overall Its CPU is not particularly fast compared with the 17in competition but it's got a decent 3D graphics chip

Features	★★★★☆
Performance	★★★☆☆
Value for money	★★★☆☆
Overall	★★★☆☆

Rock Pegasus 710

Price £999 **Contact** Rock 0845 688 0501 www.rockdirect.com

Our Pegasus 710 review unit came with a Core 2 Duo T7500 but Rock says it will ship with a T8300 imminently, based on Penryn architecture. It runs 200MHz faster than the T7500, and has 3MB L2 cache, rather than 4MB on the T7500.

On balance, performance will be almost identical since less cache affects heavily multi-threaded programs like Cinebench, but the higher clock speed will improve performance in office applications.

Combined with 2GB of Ram and a Geforce 8600M GS (which is a tad slower than 8600M GTs) it performed reasonably across our benchmarks. In our usability tests we discovered an annoying flaw with the keyboard: it's large and quiet but the spacebar sits behind a chassis ridge which our thumbs continually hit. At 1,440x900, the screen's resolution is a fraction low for a 17in LCD and we thought it looked dull in our subjective tests, borne out by it coming last when we measured brightness with the Spyder3Elite calibrator.

The Pegasus 710's solid chassis comes with a decent array of ports, a card reader, Draft-N Wifi and Bluetooth. Four USB ports are placed around the rear-right corner, which makes them less accessible than most other notebooks. They come in two stacks, which means if you use thick peripherals, such as a USB TV tuner, you're liable to block one port.

Like Acer, Rock includes an HD DVD drive, which can't write to HD DVDs but can to DVDs. We're nonplussed about the HD DVD drive in the Pegasus 710. Toshiba announced it was discontinuing standalone HD DVD players for the home, but is still undecided on what to do with HD DVD drives in laptops and PCs. For now the standard isn't going to disappear in the PC space. The Pegasus 710's three-year warranty is impressive, but the dim screen won't be pleasant to use on a daily basis.

Verdict

Pros Three-year warranty; reasonable system performance

Cons Dim screen; poor USB accessibility

Overall The screen's low resolution and brightness limit the appeal of an otherwise fast and feature-rich laptop

Features	★★★☆☆
Performance	★★★☆☆
Value for money	★★★☆☆
Overall	★★★☆☆

Samsung X22

Price £880 **Contact** Samsung 0870 726 7864 www.samsung.co.uk

Samsung's X22 grey chassis is sturdy and provides good support to the screen. The metallic finish, where your wrists sit, whiffs of class. That class flows through to a very neat strip of status lights on the front edge, a subtle but high-quality trackpad and a responsive keyboard.

The keyboard has a silver-ion coating that has been proven to act as an excellent anti-bacterial and preservative layer which, in this case, keeps the most difficult-to-clean part of a notebook fresh.

Inside you get a Core 2 Duo T7500, 2GB of Ram and a 160GB hard disk. The hard disk is a hybrid drive, which has 160GB of mechanical storage whizzing at 5,400 revolutions per minute and 256MB of Flash memory. In theory, this improves performance by taking advantage of Vista Readyboost, but so far we've been unable to measure any improvement.

The graphics card, a Radeon HD 2400, is a great deal better than Intel's integrated graphics present on the other portable notebooks.

There's a microphone on every one of the notebooks tested this month. The X22's is located just above the trackpad and it joins some clear but slightly tinny speakers below the screen.

Widescreen displays are well suited to DVD playback, but the X22's 14.1in LCD suffers from some backlight bleed at the bottom, producing colour gradients and its colour reproduction was good, even if it didn't do too well in the brightness test.

The notebook lasted just one hour, 34 minutes in our DVD run-down test. A paltry 2,600mAh battery is to blame. We were quoted an incredible £256.49 for an extended 3,600mAh battery from Samsung's preferred supplier Partmaster.co.uk, making it very hard to recommend this notebook.

Verdict

Pros Decent processor performance; classy chassis

Cons Small battery included; expensive to buy replacement; backlight bleed

Overall The X22 is light and compact, but its poor battery life limits its portability

Features	★★★★☆
Performance	★★★☆☆
Value for money	★★☆☆☆
Overall	★★★☆☆

Toshiba Satellite P200-1K9

Price £999 **Contact** Toshiba 0870 444 8944 www.computers.toshiba.co.uk

If ever there was a notebook that deserved the term desktop replacement, it is the Satellite P200-1K9. At 5.2cm thick, it towers above the other notebooks when closed and its overall volume is just a fraction more than the terrifically ugly Acer.

The chassis design is better than Acer's Gemstone, with the glittery-blue LCD backing panel looking attractive and the inclusion of six USB ports.

Another triumph of Toshiba's design is the large trackpad sunk into the chassis so it's not in the way as you type. The keyboard is a mixed affair, though. It's raised (unlike the Rock Pegasus 710's where you bash the chassis as you type), but the rough texture can be unnerving if rough surfaces make you judder.

There's a large separate numeric pad but there is a small amount of wobble on each key as you type.

We can't praise Toshiba's Harman Kardon branded speakers enough. Located above the keyboard they consist of just two satellites and a subwoofer, but these speakers are still the most refined in the group.

The 17in screen is bright and vibrant, but we hesitate to award it full marks as the 1,440x900 resolution isn't very detailed for a 17in display.

Every aspect of its performance is on a par with Acer's since it uses the same T7500 processor, 3GB of Ram and a similar 250GB hard disk. The only differences are the lack of an HD DVD drive, perhaps a good point given the recent demise of this standard, and a Radeon HD 2600 graphics card rather than an Geforce 8600M GT. The Radeon offers better high-definition video decoding, while the Geforce edges it in most games.

If the P200-1K9 had a higher resolution screen, it would be our winner, but as it stands it's still worth the money.

Verdict

Pros Excellent connectivity; good performance; great speakers

Cons Average battery life; thick chassis; low-resolution screen

Overall The P200-1K9 goes head to head with Acer's notebook but the Aspire's 7720's screen delivers the knock-out blow

Features	★★★☆☆
Performance	★★★★☆
Value for money	★★★★★
Overall	★★★★☆

Zoostorm 4-6641 Ultimate

Price £999 **Contact** PC Nextday 0870 609 0125 www.pcnextday.co.uk

The Zoostorm 4-6641 has a fast Penryn chip, the Core 2 Duo T9500 running at 2.5GHz, 4GB of Ram and a whopping 320GB hard disk. There exists a faster Penryn mobile chip, the gaming X9000 design, but it draws significantly more power and we've yet to see any notebook using it.

Penryn chips have SSE4.1 extensions, which should let future programs run faster, but for now its 6MB L2 cache gave it a serious advantage in Cinebench. It also did well in our battery benchmarks thanks to a large battery that juts out from the chassis.

The usable Ram is limited to 3GB by the 32-bit Vista installed on the Zoostorm. Vista Ultimate has every feature in the Home Premium and Business editions, as well as tools such as Bitlocker drive encryption and Dreamscene, which lets you have movie wallpapers instead of static images.

The included Geforce 8600M GS graphics are fine for the odd game at the 15.4in screen's native 1,280x800 resolution, though it will struggle with high detail settings. The display was clear and vibrant, but had rather greyish whites and its resolution is limiting for a modern notebook.

The Mitac 8252D chassis has a bland, cheap-looking design. This gets very warm where your wrists sit within an hour. The layout of the USB ports is poor as all four are stacked around one of the rear corners. It contains rather average sounding speakers, a small trackpad and a responsive keyboard with well proportioned keys. Draft-N Wifi, Bluetooth and Gigabit Ethernet are all omitted, leaving you with yesteryear's 802.11g and 100Mbit Ethernet for networking.

The 4-6641 has had lots of cash thrown at its essentials, but lacks some of the frills around the edges that make computing fun.

Verdict

Pros Superb CPU performance; good battery life; biggest hard disk

Cons Dull chassis; can get warm to touch; poor USB-port access; no Gigabit Ethernet

Overall If you don't care what a notebook looks like and need raw power, then this is the fastest horse

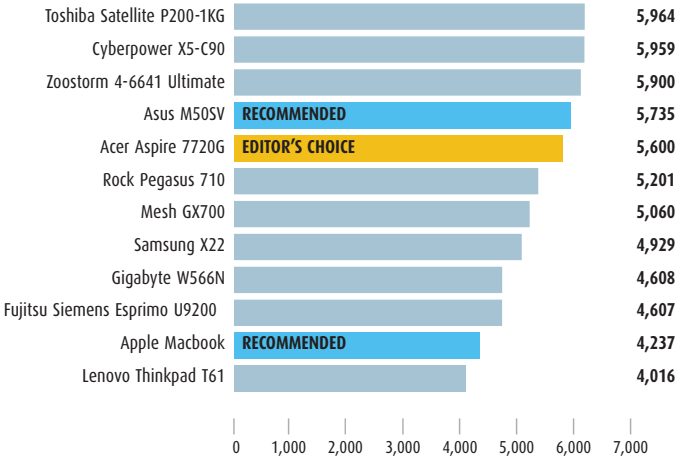
Features	★★★☆☆
Performance	★★★★★
Value for money	★★★★★
Overall	★★★★☆

Lab results

Zoostorm's 4-6641 Ultimate performed consistently well in the PCmark05 tests, but Asus' M50SU topped the 3D benchmarks

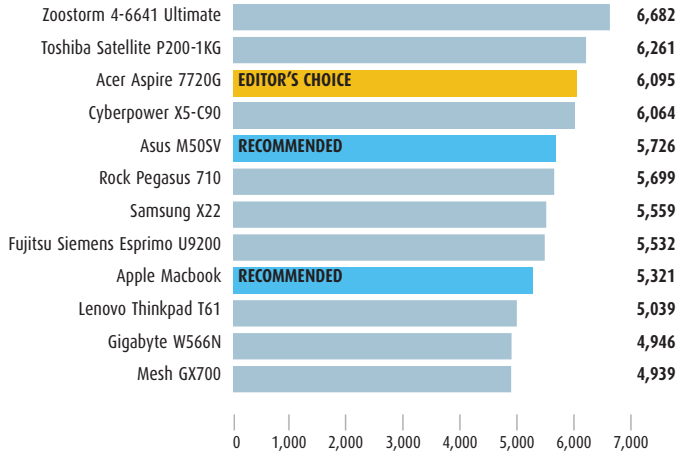
PCmark05 (overall)

Bigger is better



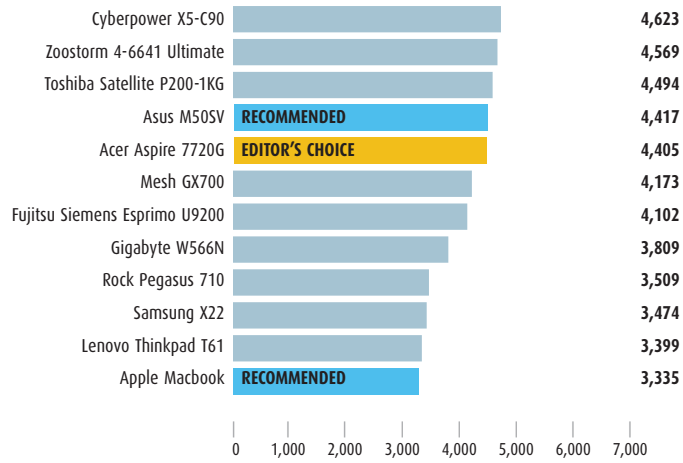
PCmark05 (CPU)

Bigger is better



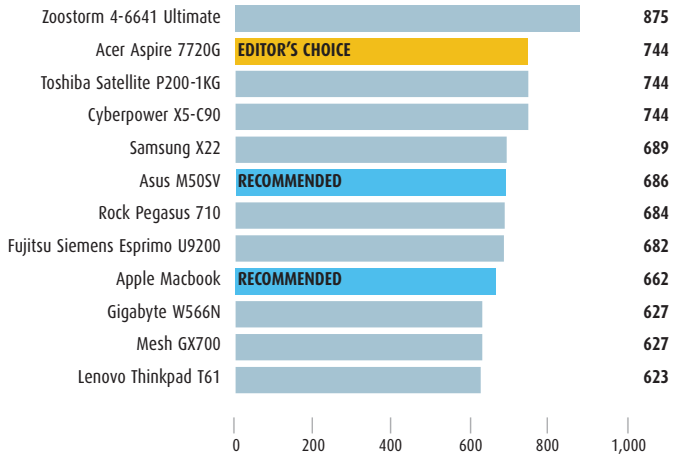
PCmark05 (hard disk)

Bigger is better



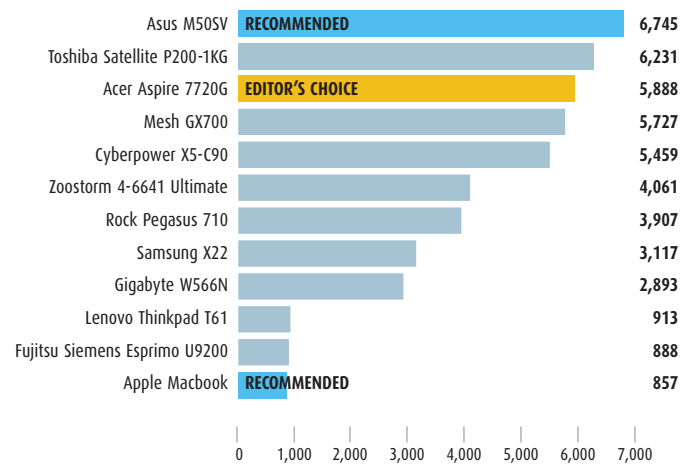
Cinebench 9.5 (multi-CPU)

Bigger is better



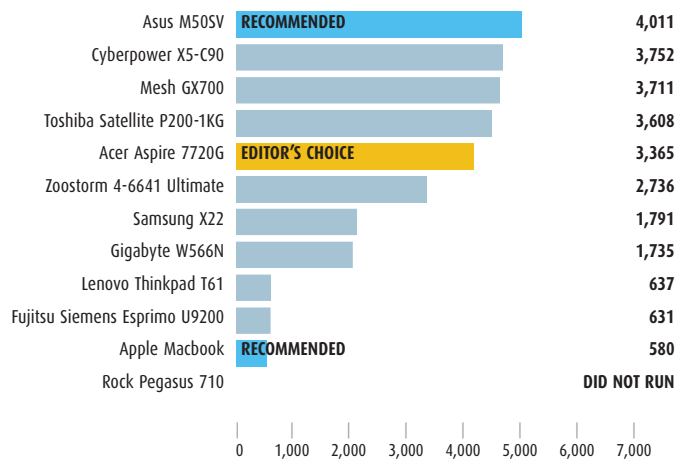
3Dmark05 (1,024x768 in 32-bit colour)

Bigger is better



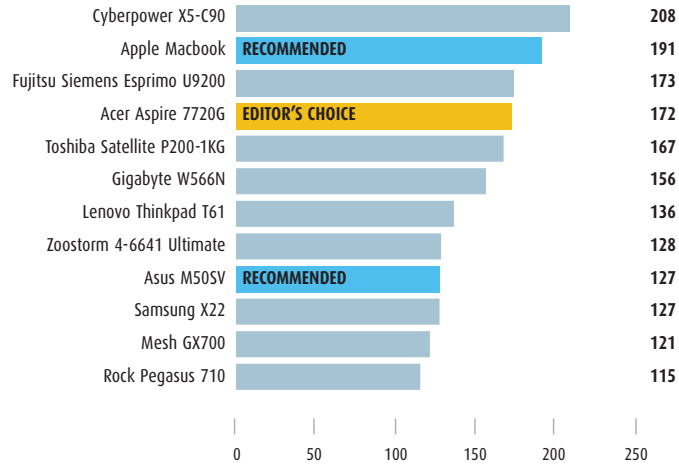
3Dmark06 (1,024x768 in 32-bit colour)

Bigger is better



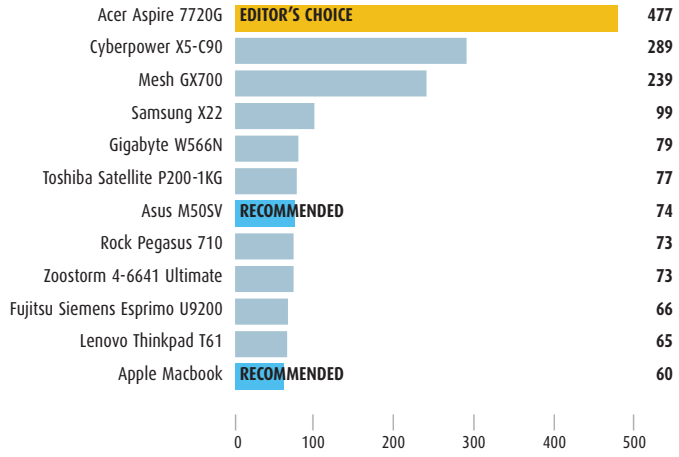
Screen brightness (cd/m²)

Bigger is better



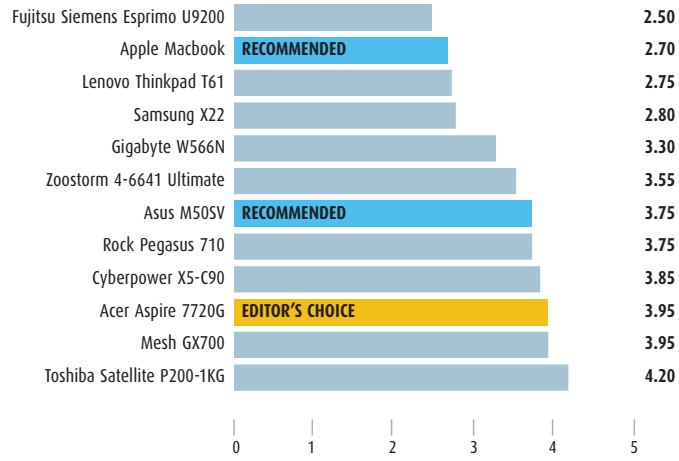
LCD contrast ratio

Bigger is better



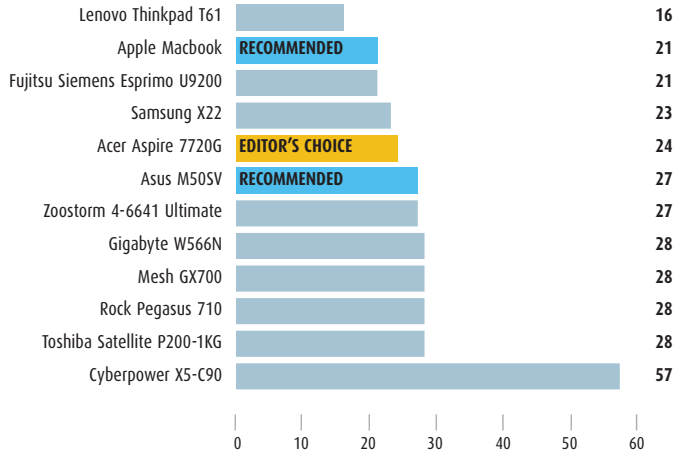
Weight (kg)

Smaller is better



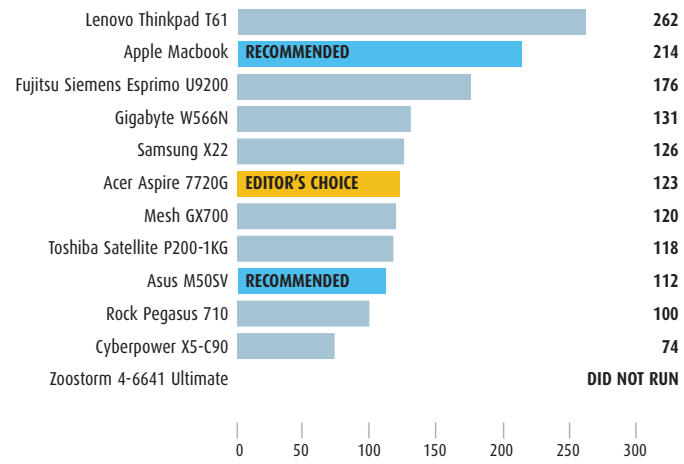
Power consumption (idle, in Watts)

Smaller is better



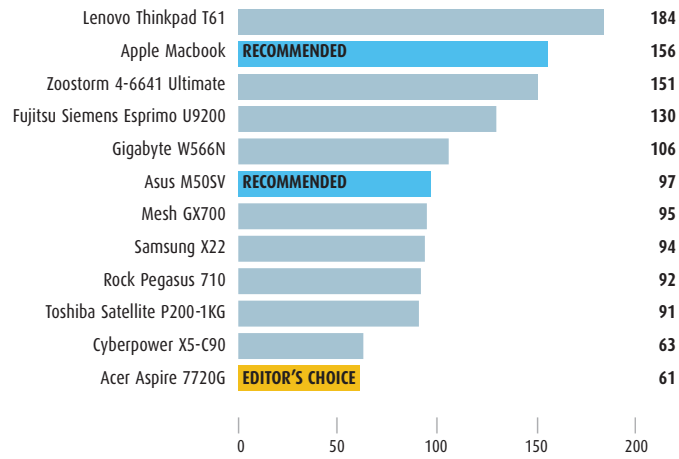
Mobilemark 2007 reader (mins)

Bigger is better



Mobilemark 2007 DVD (mins)

Bigger is better



Laptops under £1,000

MANUFACTURER	ACER	APPLE	ASUS	CYBERPOWER	FUJITSU SIEMENS
Model	Aspire 7720 Gamers	Macbook	M50SV-AS027C	X5-C90	Esprimo Mobile U9200
Price	£999	£829	£899	£999	£950.58
Delivery charge (UK mainland)	Free	Free	Dependent on retailer	Free	Dependent on retailer
Sales telephone	0845 800 1020	0800 048 0408	020 7631 2020	0800 019 0863	0845 678 0172
URL	www.play.com	www.apple.com/uk	http://uk.asus.com	www.cyberpower system.co.uk	www.fujitsu-siemens.co.uk
HARDWARE					
Processor	Intel Core 2 Duo T7700	Intel Core 2 Duo T7500	Intel Core 2 Duo T7500	Intel Core 2 Duo E6600	Intel Core 2 Duo T7500
Speed	2.4GHz	2.2GHz	2.2GHz	2.4GHz	2.2GHz
Chipset	GM965/ICH8-M	GM965/ICH8-ME	GM965/ICH8-ME	i945G/ICH7/R	GM965/ICH8-ME
Ram	3GB 667MHz DDR2	1GB 667MHz DDR2	3GB 667MHz DDR2	2GB 667MHz DDR2	2GB 667MHz DDR2
Occupied/spare memory slots	2/0	2/0	2/0	2/0	2/0
Hard disk manufacturer and model	Western Digital WD2500BEVS	Seagate Momentus 5400.3	Hitachi 5K250	Seagate Momentus 7200.2	Seagate Momentus 5400.3
Hard disk size and speed	250GB 5,400rpm	120GB 5,400rpm	250GB 5,400rpm	120GB 7,200rpm	120GB 5,400rpm
Number of Express Card slots	1x54mm	0	1x54mm	1x54mm	1x34mm
Number of PC Card slots	0	0	0	0	0
Number of USB ports	4	2	4	3	3
Number of Firewire ports	1	1	1	1	0
MULTIMEDIA					
Graphics processor manufacturer and model	Nvidia Geforce 8600M GT	Intel GMA X3100	Nvidia Geforce 9500M GS	Nvidia Geforce 8600M GT	Intel GMA X3100
Graphics processor memory	512MB DDR2	8-224MB shared Ram	512MB DDR2	512MB DDR2	8-224MB shared Ram
Screen size and native resolution	17in 1,920x1,200	13.3in 1,280x800	15.4in 1,280x800	15.4in 1,680x1,050	12.1in 1,280x800
Video outputs	DVI, VGA, S-video	Mini-DVI	HDMI, VGA	HDMI, VGA	VGA, S-video
Optical drive manufacturer and model	Toshiba TS-L802A	HL-DT-ST GSA-S10N	Matshita UJ-861S	Matshita UJ-850S	HL-DT-ST GSA-T20N
Optical formats supported	HD DVD, DVD+/-RW, DVD-Ram	DVD+/-RW, DVD-Ram	DVD+/-RW, DVD-Ram	DVD+/-RW, DVD-Ram	DVD+/-RW, DVD-Ram
Soundchip	Realtek HD	Realtek HD	Realtek HD	Realtek HD	Realtek HD
Soundchip output (from 3.5mm or S/PDIF jacks)	5.1	5.1	5.1	5.1	2
Speaker setup	2.1	Stereo	Stereo	Stereo	Stereo
OTHER INFORMATION					
Additional hardware	0.3-megapixel webcam, Gigabit Ethernet, 3-in-1 card reader, 56K modem	1.3-megapixel webcam, Gigabit Ethernet	1GB Turbo memory, TMP 12, 1.3-megapixel webcam, Gigabit Ethernet, 56K modem, fingerprint reader, 2-in-1 card reader, eSata, bag, mouse	2-megapixel webcam, Gigabit Ethernet, 56K modem, fingerprint reader, 2-in-1 card reader, eSata	1.3-megapixel webcam, Gigabit Ethernet, 56K modem, 2-in-1 card reader
Wireless networking	802.11a/b/g/Draft-N Wifi	802.11a/b/g/Draft-N Wifi, Bluetooth	802.11a/b/g/Draft-N Wifi, Bluetooth	802.11a/b/g/Draft-N Wifi, Bluetooth	802.11a/b/g/Draft-N Wifi, Bluetooth, HSDPA
Battery capacity (milliamp hours or Watt hours)	4,000mAh	55Wh	4,800mAh	4,800mAh	5,200mAh
Dimensions in mm (wxdxh)	403x300x49	325x226x28	375x270x45	368x303x48	300x222x38
Operating system	Windows Vista Home Premium	Mac OS 10.5 (Leopard)	Windows Vista Home Premium	Windows Vista Home Premium	Windows Vista Business
Included software	NTI DVD Maker 7, Cyberlink Powerproducer, Microsoft Works 8.5, Cyberlink Arcade Deluxe	Apple iLife 08 suite	None	Asus Turbogear Overclocking Software, PowerDVD, Nero Essentials	Nero Essentials
Standard warranty (RTB = return to base, C&R = collect and return)	1yr RTB	1yr RTB	2yrs C&R	1yr RTB	1yr C&R
SCORES					
Features	★★★★☆	★★★★★	★★★★☆	★★★★★	★★★★☆
Performance	★★★★★	★★★☆☆	★★★★☆	★★★☆☆	★★★☆☆
Value for money	★★★★★	★★★★☆	★★★★★	★★★☆☆	★★★☆☆
OVERALL	★★★★★	★★★★☆	★★★★☆	★★★☆☆	★★★☆☆

	GIGABYTE	**LENOVO**	**MESH**	**ROCK**	**SAMSUNG**	**TOSHIBA**	**ZOOSTORM**
	W566N	T61 UZ26DUK	GX700	Pegasus 710	X22	Satellite P200-1K9	4-6641 Ultimate
	£774.81	£1,022	£999	£999	£880	£999	£999
	£9.95	Dependent on retailer	Free	£23.50	Dependent on retailer	Dependent on retailer	£5.99
	0161 868 0868	0800 169 1451	08447 360 440	0845 688 0501	0870 726 7864	0870 444 8944	0870 609 0125
	www.expansys.com	www.lenovo.co.uk	www.meshcomputers.com	www.rockdirect.com	www.samsung.co.uk	www.computers.toshiba.co.uk	www.pcnextday.co.uk
	Intel Core 2 Duo T7250	Intel Core 2 Duo T7250	Intel Core 2 Duo T7250	Intel Core 2 Duo T7500	Intel Core 2 Duo T7500	Intel Core 2 Duo T7700	Intel Core 2 Duo T9500
	2GHz	2GHz	2GHz	2.2GHz	2.2GHz	2.4GHz	2.6GHz
	GM965/ICH8-ME	GM965/ICH8-M	GM965/ICH8-ME	GM965/ICH8-ME	GM965/ICH8-ME	GM965/ICH8-ME	GM965/ICH8-ME
	2GB 667MHz DDR2	2GB 667MHz DDR2	2GB 667MHz DDR2	2GB 667MHz DDR2	2GB 667MHz DDR2	3GB 667MHz DDR2	4GB 667MHz DDR2
	2/0	2/0	2/0	2/0	2/0	2/0	2/0
	Fujitsu MHW2160BHPL	Western Digital WD1600BEVS	Western Digital WD2500BEVS	Fujitsu MHW2160BH	Samsung HM16HJI	Toshiba MK2546GSX	Western Digital WD3200BEVT
	160GB 5,400rpm	160GB 5,400rpm	250GB 5,400rpm	160GB 5,400rpm	160GB 5,400rpm + 256MB SSD	250GB 5,400rpm	320GB 5,400rpm
	1x54mm	1x54mm	1x54mm	1x54mm	1x34mm	1x54mm	1x54mm
	0	1	0	0	0	0	0
	4	3	3	4	3	6	4
	1	0	1	0	0	1	0
	Nvidia Geforce 8400M GS	Intel GMA X3100	Nvidia Geforce 8600M GT	Nvidia Geforce 8600M GS	ATI Mobility Radeon HD 2400	ATI Mobility Radeon HD 2600	Nvidia Geforce 8600M GS
	256MB DDR2	8-224MB shared Ram	512MB DDR2	256MB DDR2	128MB GDDR3	512MB DDR2	512MB DDR2
	15.4in 1,280x800	14.1in 1,024x768	17in 1,680x1,050	17in 1,440x900	14.1in 1,280x800	17.1in 1,440x900	15.4in 1,280x800
	DVI, S-video	VGA	HDMI, VGA	HDMI, DVI	HDMI, VGA	HDMI, VGA, S-video	HDMI, DVI
	Optiarc AD-7530B	HL-DT-ST GSA-U10N	Optiarc AD-7530B	Toshiba SD-L802B	Teac DV-W28ECS	TSSTcorp TS-L632H	TSSTcorp SN-S082H
	DVD+/-RW, DVD-Ram	DVD+/-RW, DVD-Ram	DVD+/-RW, DVD-Ram	HD DVD, DVD+/-RW, DVD-Ram	DVD+/-RW, DVD-Ram	DVD+/-RW, DVD-Ram	DVD+/-RW, DVD-Ram
	Realtek HD	Soundmax HD	Realtek HD	Realtek HD	Realtek HD	Realtek HD	Realtek HD
	5.1	2	5.1	5.1	2	5.1	5.1
	Stereo	Stereo	4.1	2.1	Stereo	2.1	2.1
	1.3-megapixel webcam, Gigabit Ethernet, 56K modem, 2-in-1 card reader TPM 1.2	Gigabit Ethernet, 56K modem, fingerprint reader, TPM 1.2, screen light	1.3-megapixel webcam, Gigabit Ethernet, 56K modem, 2-in-1 card reader, rucksack, mouse	1.3-megapixel webcam, Gigabit Ethernet, 2-in-1 card reader, 56K modem	1.3-megapixel webcam, Gigabit Ethernet, 3-in-1 card reader, 56K modem	1.3-megapixel webcam, Gigabit Ethernet, 3-in-1 card reader, 56K modem	0.3-megapixel webcam, 10/100 Ethernet, 2-in-1 card reader, 56K modem
	802.11a/b/g Wifi	802.11a/b/g Wifi, Bluetooth	802.11a/b/g/Draft-N Wifi	802.11a/b/g/Draft-N Wifi, Bluetooth	802.11a/b/g/Draft-N Wifi, Bluetooth	802.11a/b/g/Draft-N Wifi, Bluetooth	802.11a/b/g Wifi
	4,800mAh	5,200mAh	4,800mAh	4,500mAh	2,600mAh	4,000mAh	6,600mAh
	357x256x43	255x313x35	395x276x40	392x278x41	336x244x42	398x287x52	359x276x43
	Windows Vista Home Premium	Windows Vista Business	Windows Vista Home Premium	Windows Vista Home Premium	Windows Vista Home Premium	Windows Vista Home Premium	Windows Vista Ultimate
	None	Think Vantage utilities, PC-Doctor 5	Microsoft Works 8.5, Cyberlink PowerDVD, Power2Go, Powerproducer	None	Cyberlink PowerDVD, Samsung Recovery Solution, Play AV Station	Microsoft Works 8.5, Toshiba DVD Player, Ulead DVD Moviewriter	None
	2yrs RTB	3yrs RTB	2yrs (1yr C&R, 1yr RTB)	3yrs C&R	1yr C&R	1yr C&R	1yr RTB
	★★☆☆☆	★★★★☆	★★★★☆	★★★☆☆	★★★★☆	★★★☆☆	★★★☆☆
	★★★☆☆	★★★★☆	★★★☆☆	★★★☆☆	★★★☆☆	★★★★☆	★★★★★
	★★★★☆	★★★☆☆	★★★☆☆	★★★☆☆	★★☆☆☆	★★★★★	★★★★★
	★★★☆☆	★★★★☆	★★★☆☆	★★★☆☆	★★★☆☆	★★★★☆	★★★★☆

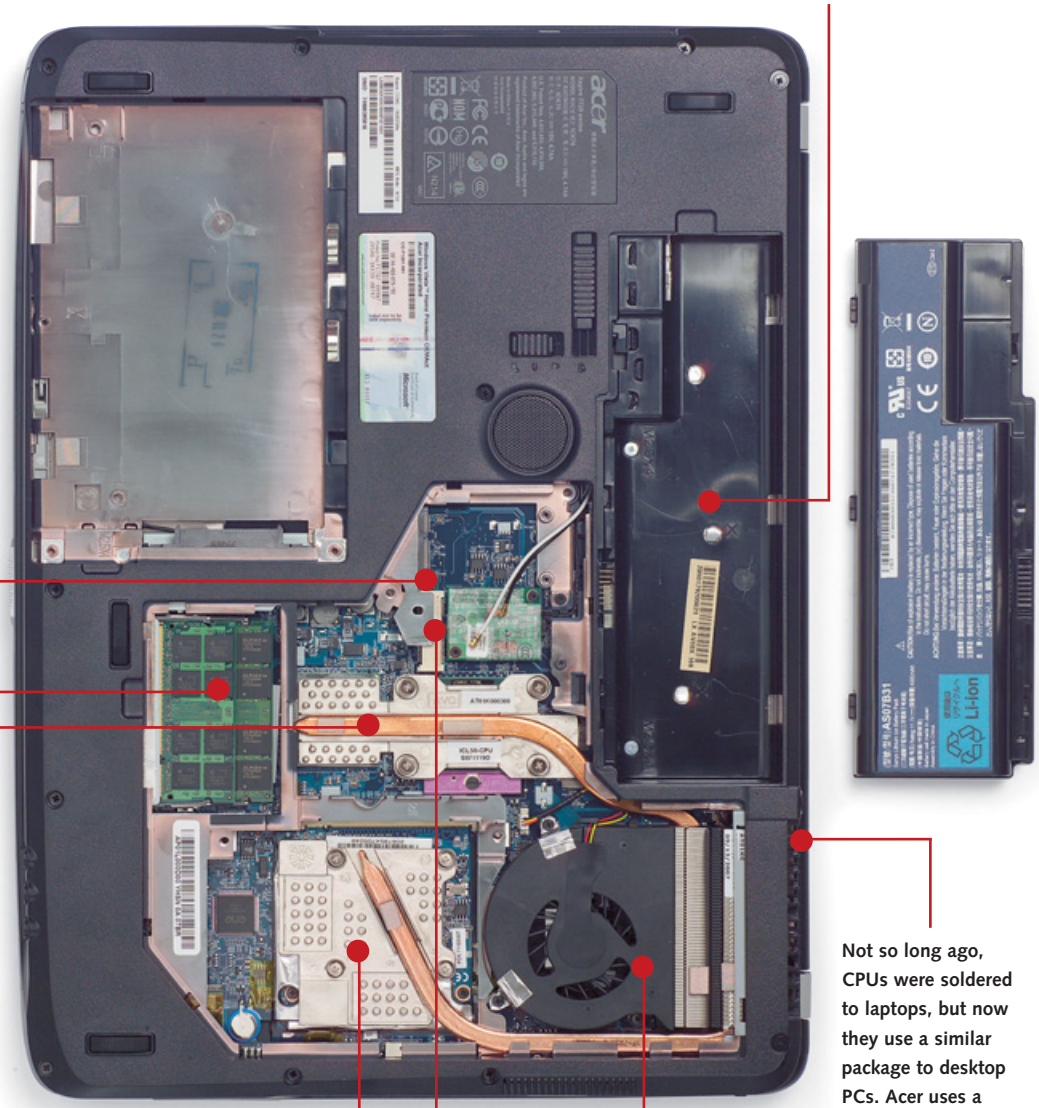
Vendors of group test products are only obliged to sell them at the prices quoted here (which include credit card surcharges) for the life of this PCW issue. They may also change components under certain circumstances. ↘

Dissecting the Acer Aspire 7720G

Our Editor's Choice is a great example of how easy it is to expand and upgrade a modern notebook using just a cross-head screwdriver

A removable hard disk bay has space for two 2.5in Sata drives. One is filled with a 250GB disk while the other can be used to increase capacity at a later date.

The battery requires two latches to be moved before it can be replaced. Most manufacturers only provide a one-year warranty for their batteries, highlighting how Lithium Ion deteriorates with use.



A second PCI Express Mini Card lets you add whatever takes your fancy. For example Readyboost memory or an HSDPA modem.

You get two slots for Ram, which Acer fills with one 1GB Dimm and one 2GB Dimm.

The Santa Rosa chipset (965) gets cooled by the same block and copper heatpipe as the CPU.

The Nvidia graphics card uses an MXM slot which, in theory, is easily upgradeable. The only problem is MXM graphics cards are almost impossible to buy.

This is the PCI Express Mini slot that Acer fits an Intel Wifi card into. Two leads, one white and one black, connect it to an antenna in the LCD bezel to improve reception.

Two copper heatpipes transfer heat from the CPU, chipset and graphics card to the exhaust system, which is essentially a heatsink and fan that blows out hot air.

Not so long ago, CPUs were soldered to laptops, but now they use a similar package to desktop PCs. Acer uses a Socket P here, which accommodates 478 pins and can be paired with a range of Core 2 Duo processors including the latest T9000 Penryns. To upgrade, simply remove the cooling block by removing a few crosshead screws.

Editor's Choice

Editor's Choice Acer Aspire 7720 Gamers
Recommended Asus M50SV • Apple Macbook

Acer Aspire 7720 Gamers

Asus M50SV

Apple Macbook

We chose three winners this month, two desktop replacements and one portable notebook. Yet with such as diverse range of notebooks, any one of them could be the right one for you depending on your particular needs.

If you want the biggest bang for your buck, Acer's Aspire 7720 Gamers impressed us and picked up the Editor's Choice. Its 1,920x1,200 resolution screen lets you take full advantage of high-definition video, be it upcoming HD movie download rentals, HD DVDs or movie trailers. It's also perfect for sitting two documents side by side; in fact, you could probably squeeze in a third, smaller window such as an instant messaging application and still be productive.

The result of high-resolution screens is smaller pixels, which has left many of us squinting at tiny icons and text in software in recent years. But by tweaking the new accessibility options in Windows Vista, many of these problems can be overcome.

Despite it grabbing the top award, there are some niggles with the Acer. It looks fine with the lid closed, but open it up and its awkward lines and unpleasant grey colour would make it the laughing stock in any fashion show.

Acer's trackpad and keyboard are also flawed, but as with any desktop replacement, it's best to use an external mouse and keyboard to get the best posture and minimise the risk of painful repetitive strain injury.

Its meagre battery life reflects that it's really a desktop in a notebook's clothing. In many ways, having a battery as a stop gap in between power cuts and moving rooms instead of a permanent source of power is perfectly acceptable.

Sure, not all trains have electric outlets, but notebooks like the Acer Aspire 7720 make justifying the purchase of a bulky desktop PC very difficult. System performance from the Core 2 Duo T7700 was top notch and the odd amount of Ram (3GB) makes good sense since and extra gigabyte would go to waste due to the intricacies of 32-bit Windows. The 64-bit version of Windows, which can see all 4GB, still has many software and driver incompatibilities.

The Aspire 7720's Geforce 8600M GT was about as good as it got on the graphical side of things. We had really expected at least one notebook to provide a faster graphics card, perhaps a Geforce 8800, and Asus almost fulfilled our wish when it accidentally delivered us one of the first Radeon HD 3650 mobile graphics cards in the country.

It's a design we won't review until next month as it wasn't a complete system, and it may coincide with a look at Intel's first mobile quad-core chip, according to industry whispers.

Even without the Radeon HD 3650, Asus' M50SV deserves a Recommended award. It's a reasonably attractive chassis and provides just about the same performance as you get from the Aspire 7720, while filling a smaller space. We were expecting its Geforce 9500M GS graphics card to score identically to Geforce 8600M GTs since, on paper, the two look identical.

We suspect Geforce 9000-series driver optimisations are the source of the M50SV's resounding first place in the 3D benchmarks.

The M50SV also thrilled us with its many ports, Draft-N Wifi and TMP 1.2 security chip. We've come to ignore the inclusion of Readyboost memory (the M50SV has 1GB), but Vista's Service Pack 1 may rectify some of the bizarre performance dives you get when you enable Readyboost.

However, with Readyboost enabled on the Asus, its hard drive score in PCmark05 shot up to 6,185 from 4,417. This came as a big surprise since *PCW*'s Gordon Laing has extensively proven that, in real software applications instead of synthetic benchmarks such as PCmark05, Readyboost can have an adverse affect on performance. Read more at **www.pcw.co.uk/2195469**.

As for our favourite lightweight notebook here, we were torn between Lenovo's T61, Fujitsu Siemens' Esprimo U9200 and Apple's Macbook. After much consideration, we decided the Macbook would be the one we'd go for. The T61 has an excellent keyboard but has such lacklustre extras that only business users who perform little more than spreadsheet work should choose it. The Esprimo U9200's 3G modem is a really nice touch, but 3G USB modems are often given away for free when you commit to a tariff anyway. And the Esprimo U9200's taut trackpad and smaller screen are tiresome alongside the Macbook.

Apple's hardware design is excellent from top to bottom and the magnetic power plug is a brilliant invention – we've seen plugs get damaged many times here at *PCW*. The large trackpad, bright screen and decent keyboard means you're more likely to fall in love with a Macbook than some bland Windows notebook.

Just as we went to press, Apple announced its £829 Macbook, reviewed here, was getting 2GB Ram and a faster, 2.4GHz Penryn processor, as standard. Even before this upgrade we had decided to recommend the Macbook. Now it appears to have very few flaws indeed. At *PCW*, some of us can't stand the way Mac software works, but it took just 40 minutes to get a perfect Windows system installed and the process is so easy that even a complete novice could do it.

It could still do with a £200 price drop to bring it in line with similarly specified 13.3in Windows notebooks, like the Toshiba U300 we reviewed two months ago. That said, we still can't help but applaud, and recommend, such unique and useful design features. **PCW**

"Notebooks like the Acer Aspire 7720 make justifying the purchase of a bulky desktop PC very difficult"

AMD Phenom™ Processor

64 QuadCore 9500 AM2+ 940 PIN

64 QuadCore 9500

Multi-core processing

Socket AM2+ 940 PIN

Radeon HD3870 X2

PCI Express 2.0 x16 bus interface5

256-bit GDDR3/GDDR4 memory interface

Microsoft® DirectX® 10.1 support

Shader Model 4.1

OpenGL 2.0 support

HDMI output support

ATI CrossFireX™ Multi-GPU Technology

microdirect.com

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ON TEST

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Editor's Choice

'We've seen a version 2.0 update to the draft specification as well as a selection of new products on the market'

Live life in the fast Lan

With the ever-increasing bandwidth demanded by modern multimedia it could be time to upgrade your wireless network. Paul Monckton checks out the latest Draft-N routers

Touted as a replacement for wired networks, Draft-N wireless equipment promises much in terms of both speed and extended range.

Wireless networks are undoubtedly convenient while cables are messy, space-consuming reins that tie you to one spot. Wired networks also require an additional cable and port in your hub for each piece of equipment. However, wires have the advantage in terms of speed and the distance over which networks can be run.

While 802.11g networks are fine for many applications, they don't have the speed to keep up with the ever-increasing bandwidth demanded by modern multimedia. If you're streaming high-definition content to your TV in the living room, you don't want dropped frames and audio glitches ruining your enjoyment. If you're backing up your hard drive it's preferable to have it complete in minutes rather than hours. In these scenarios, a 54Mbits/sec wireless network just doesn't cut it.

It's been more than a year since we last looked at Draft-N routers, during which time we've seen a version 2.0 update to the draft specification as well as a selection of new products on the market. Cable broadband users still have the widest choice of routers, but many are now available with integrated DSL modems – where available, we've included prices for both in the features table.

If you're starting from scratch, or upgrading from a slower wireless network you'll also need to buy wireless Draft-N adapters for each of your PCs. Some routers come with a USB adapter included, but PCI, PC Card and Express Card adapters are usually available separately.

Belkin N1

Price £179.99 **Contact** Belkin 01933 352 000 www.belkin.co.uk

Great care has been taken to make the Belkin N1 router easy to set up. The packaging is among the friendliest we've seen, with all components individually labelled, and printed quick-start guides to help you get up and running quickly.

The router has been designed to look good in a home environment while also retaining maximum ease of use. Rather than use an array of round blinking LEDs, the router provides small illuminated icons with plain English text, much like those you would find on a computer desktop. For example, you can see immediately whether wireless or wired network connections are active without having to consult the manual to find out what the indicators mean.

Its glossy piano black and silver exterior gives the router a rather expensive look, although picking it up and holding it immediately gives away its lightweight plastic construction. A quick reference card is provided to help you protect your wireless network. But it's a shame a product that's this user-friendly doesn't come with an automated wireless security setup.

The built-in web interface is quite text-heavy, but this is due to the large amount of information provided to help you with configuration.

In our tests, performance was lacklustre at short range but improved considerably over longer distances, coming close to the top of the chart.

The price of £179.99 for this model is a whopping £80 more than for the cable version, but we found this modem version for under £100 online, so it's worth shopping around. It's also worth noting that Belkin offers two types of Draft-N router: N and N1, of which the N1 type is the higher-performance option, using three antennas rather than the two found on the N models, which cost considerably less.

Verdict

Pros Looks; ease of use; lifetime warranty

Cons Price; no one-touch setup

Overall A good choice for home ADSL users who want something that won't look too ugly in the home and is easy for beginners to use

Features	★★★☆☆
Performance	★★★☆☆
Value for money	★★★☆☆
Overall	★★★☆☆

Buffalo Wireless-N Nfiniti ADSL2+

Price £90.48 **Contact** Buffalo 01344 381 700 www.buffalotech.com

Buffalo's modem router is a compact device finished in an inconspicuous matt black and fitted with a pair of adjustable antennas. A row of indicator LEDs includes one which shows you when your network is secure.

An easy setup wizard guides you through all the steps required to get your router running and wireless security is made easy thanks to Buffalo's Airstation Onetouch Secure System (AOSS) button. When used in conjunction with Buffalo's own wireless adapters, AOSS lets you configure a securely encrypted network simply by pushing a pair of buttons – one on the router and the other either in the client software for your wireless adapter or on the physical adapter itself.

The web interface uses two panels, providing help information on the right-hand side. It offers some advanced options to help you get the best out of your network. One such feature is application-based QoS (quality of service) that allows you to prioritise different applications on your PC – this means you can ensure that your most important programs have the bandwidth they need without slowing down others.

It's a shame that performing some trivial operations, such as turning off the wireless network, require the router to be rebooted. Note that this router lacks any form of parental controls or web filtering.

Some gamers will appreciate the Nintendo Wifi Connection certification of this router. This allows easy setup of Nintendo DS and Wii devices on the wireless network, which can otherwise be tricky to set up when encryption is enabled.

Despite having only two antennas, the Nfiniti router suffered no obvious decrease in performance, with solid results in all tests and the whole package is very keenly priced.

Verdict

Pros One-touch wireless setup; advanced control options; price

Cons Only two antennas; no parental controls

Overall Basic features but solid performance at a very low price

Features	★★★☆☆
Performance	★★★☆☆
Value for money	★★★★★
Overall	★★★★☆

D-Link DKT-810

Price £119 **Contact** D-Link 020 8955 9000 www.d-link.co.uk

D-Link's DKT-810 is a kit comprising a DSL2740B router and a DWA-140 USB wireless adapter. The router is an unobtrusive and smart-looking device in black and silver which would sit comfortably at home or in an office.

A brief quick start guide is provided, but for full instructions you'll need to load the CD. Much of the configuration required, including DSL and wireless security setup, is automated by the router by means of wizards accessed via the built-in web interface.

If you forget your own configuration details a reset switch is provided to restore the factory settings, so even if you lose the manual you'll be back up and running in no time.

Three detachable antennas grace the rear of the unit while the front houses a row of very small status LEDs. Underneath, in addition to a pair of wall-mounting holes, is a convenient diagram detailing all the connectors as well as the meaning of the status indicators and a reminder of the default IP address and administrator password.

The router's wireless QoS settings let you prioritise important data traffic over the wireless network. This is useful in situations where you don't want file transfers to cause streaming video to skip. There's also some basic parental control provided which can restrict internet use by time of day – although it doesn't go as far as filtering individual sites or logging activity.

In our tests, we found performance of the DKT-810 to be average with a good signal, although it did deteriorate a little more than most over longer distances. A USB adapter is included, so the DKT-810 bundle represents very good value for money – and when you couple this with D-Link's 11-year warranty it makes an excellent choice for most users.

Verdict

Pros Wireless QoS controls; basic parental control; USB adapter included; price

Cons Below average performance over long distance

Overall Bundled with a USB adapter, the DKT-810 is excellent value for money with a competent set of features

Features	★★★★☆
Performance	★★★☆☆
Value for money	★★★★★
Overall	★★★★☆

Linksys WAG325N

Price £99.99 **Contact** Linksys 0800 068 0327 www.linksys.com

Available for a very low price, the WAG325N from Linksys delivers a surprisingly high level of features and performance. Its outrageous looks are down to its three top-mounted antennas, one of which has a large flat rectangular shape, unlike those found on any other router. Fashioned from bright blue and black plastic, it can lie horizontally or stand upright – in either orientation it looks bizarre.

This isn't all just for show, though. Although performance over a short distance was in the middle of the chart, in our tests the WAG325N outperformed every other in our longer-range tests.

Ideal for employees who work from home, the WAG325N includes VPN tunnelling, which enables encrypted connections to a corporate network for up to five users. It can also set up multiple virtual wireless networks which boost security by giving wireless clients access to the internet but not to each other.

Most built-in options on the WAG325N are highly configurable, with a greater level of control than is found on most of the competition and is ideal for power users who demand the maximum flexibility. It also offers sophisticated QoS options prioritised by application or protocol, and the ability to clone your PC's MAC address to avoid having to reregister with your ISP. You can also configure advanced networking features such as static routing tables

Thanks to the supplied setup wizard on CD, beginners will be able to set up the router easily. It includes parental control functions which allow access blocking by time of day and by web URLs.

The WAG325N is ideal for power users or support staff wanting to set up VPN connections for remote users. Its configurable port forwarding and triggering options make it a great choice for online gamers.

Verdict

Pros Price; VPN support; virtual wireless networks; good long-range performance

Cons A little complex for beginners; needs to reboot frequently when changing settings.

Overall An unconventional-looking product with excellent range and sophisticated features

Features	★★★★★
Performance	★★★★☆
Value for money	★★★★★
Overall	★★★★★

Netgear Rangemax Next DG834N

Price £99.99 **Contact** Netgear 01344 458 200 www.netgear.co.uk

Stylistically, the DG834N is a departure from what we've seen so far. While most routers, other than the Linksys product, are designed for horizontal use, the Netgear router is designed to be used only vertically. In fact, a large sticker on the side warns you not to lay it flat. Closer inspection reveals vents on the top and bottom of the chassis.

In its vertical configuration it conveys a rather modern look. It's made from plastic, yet from a distance it's reminiscent of more expensive materials such as frosted glass. It's also unique in that it's entirely devoid of any visible antennas. Three fixed antennas are housed within the case, but the fact that you can't see them gives the product a tidy appearance would look good on either a desk or a bookshelf.

You might expect the internal antennas to cause performance to suffer, but while the DG834N wasn't the fastest router of the group, it certainly held its own in all our tests. It did, however, provide the weakest signal of all in our distance tests, suggesting that its overall maximum range may be somewhat shorter.

Setup is easy, with an automated ISP detection wizard included in the web-based interface – the default configuration and credentials are printed on the bottom of the device. You get advanced settings such as static routing and MAC address cloning for those ISPs that require a single registered MAC address.

The DG834N offers sophisticated parental controls which allow site blocking by keyword or domain name but also allow trusted IP addresses to bypass the security. This means you can easily configure a family PC with full parental controls, but allow your laptop to access all sites. It also offers customisable email alerts so you don't need to wade through the logs to find out who has been doing what on your network.

Verdict

Pros Decent performance; good design; parental controls
Cons Lack of QoS; no VPN support
Overall Very neat with no external antennas and decent overall performance

Features	★★★★☆
Performance	★★★☆☆
Value for money	★★★★★
Overall	★★★★☆

Sitecom WL-541

Price £119.99 **Contact** Sitecom 0905 830 0102 www.sitecom.com

Sitecom's WL-541 is designed for use with an external modem and is therefore most likely to appeal to cable broadband users.

It has a compact and unusual design. Three adjustable antennas are mounted on the opposite side of the device to the network ports, power connector and reset button. This means the status LEDs have to be moved somewhere else, in this case to the top of the unit where they're much harder to see – especially if you have located the router up high to gain the best signal coverage.

Many of these routers are suitable for wall-mounting and Sitecom's model is no exception; in this case a separate clip-on plastic frame is used to fix it to the wall, which we think looks a bit tacky.

Our review product, the WL-541, is a bundle which includes both a WL-183 wireless router and a WL-182 USB adapter. If you don't require this adapter, you can pick up the router on its own for around £80.

Ease-of-use features include a one-touch wireless security setup and a simple wizard as part of the browser-based interface which sorts out the initial configuration of the router. Also included are easy application-based firewall rules that allow you to select common applications by name, such as 'MSN' or 'MMS media streaming services'. The router will then configure the relevant network ports automatically so they work correctly on the internet.

The Sitecom router had excellent performance, coming second overall over a short distance and achieving good speeds over longer ranges with the strongest measured signal strength over that distance.

It's not the most aesthetically pleasing and the fact that there's currently no ADSL version available is disappointing, but it performs well.

Verdict

Pros 10-year warranty; excellent performance
Cons Not the best-looking router; no ADSL version
Overall Excellent performance and a long warranty

Features	★★★★☆
Performance	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

Solwise Engenius Wireless-N Gigabit Router

Price £108.95 **Contact** Solwise 0845 458 4558 www.solwise.com

This tiny router from Solwise may look unassuming, but it delivers superb performance and a wide range of features. For ease of use, the router supports Wifi Protected Setup to allow a simple push-button method of setting up a secure network. But in an odd twist, the company's own USB adapter has no such button.

We also found that Solwise provided no drivers for 64-bit Windows Vista, although we found suitable software available directly from chipset manufacturer, Ralink.

One area where this router excels is in its highly sophisticated filtering and parental control options, for example, you can create blacklists or whitelists of websites and apply them to individual client PCs. You also get QoS options for internet and wireless traffic, giving you precise control over your throughput. If you want to be a good neighbour, you have the option of reducing the power output of your wireless signal.

All this makes the router slightly trickier to set up and there's a little less hand-holding in evidence with the online help than we've seen on other products, but if you want ultimate control and sophistication, the Solwise Engenius is hard to beat. It's also the only one of the group to support Gigabit Ethernet.

It performs extremely well, consistently scoring highly in our benchmarks for both long- and short-range communication.

However, all this sophistication comes at a price. At £108.95, it does not come with a built-in DSL modem nor a USB wireless adapter and there are many cheaper options available if you don't require the advanced tools. Solwise doesn't sell a modem-router version of this product, so DSL users would have to buy an additional Ethernet modem.

Verdict

Pros Compact; Gigabit Lan; superb performance; good parental control

Cons Expensive; no ADSL version

Overall A little pricey, but excellent performance and features along with sophisticated network filtering

Features	★★★★★
Performance	★★★★★
Value for money	★★★★☆
Overall	★★★★★

Dual-band and 5GHz wireless

All the products we've looked at in this group test, like older-generation wireless equipment, use the 2.4GHz frequency band for data communication.

Some rare adapters use the 802.11a standard for 54Mbits/sec communication over the 5GHz band. Because these products operate over a different range of frequencies they don't interfere with, or suffer from, the presence of nearby 2.4GHz networks.

Unlike previous standards, 802.11n is capable of operating over either frequency band and high-end products are now being manufactured that are capable of operating over both simultaneously.

These so-called dual-band devices offer many advantages over their 2.4GHz counterparts. In busy neighbourhoods you may find a large number of wireless networks in range of your home. With limited Wifi channels available, these are likely to interfere with your own wireless signals and reduce the performance of your network.

It's not only other wireless networking devices that can cause you problems. Wifi doesn't get to keep the 2.4GHz frequency band all to itself: it must share it with a large number of other devices that are licensed to use it. These can include some cordless telephones, Bluetooth peripherals and radio-controlled toys. It's not limited to wireless communication either, as 2.4GHz is the same frequency used by microwave ovens, which can have an effect on your throughput.

A typical Draft-N network will leave you with only three channels to choose from if you're going to operate at full speed. With 5GHz equipment, this increases to 23. A dual-band router therefore gives you many more channels to choose from and because 5GHz networks are currently so uncommon, you're much more likely to have the entire bandwidth to yourself.

Wireless communications using the 5GHz band are typically absorbed more easily by walls and other obstacles than those using 2.4GHz carriers which can limit the range, but this is usually more than offset by the advantages of less interference from other devices.

Sadly, in the UK dual-band devices are uncommon, although we've seen products made available for the US market from companies such as Netgear. Buffalo currently offers a UK dual-band product in the form of the Wireless-N Nfiniti Dual Band Gigabit Broadband Router and Access Point. With this router you can create separate wireless networks on each band simultaneously, keeping legacy devices separate from your high-speed Draft-N equipment.

UK dual-band wireless devices are rare. Buffalo offers the Nfiniti Dual Band Gigabit Broadband Router

Draft-N routers

MANUFACTURER	**BELKIN**	**BUFFALO**	**D-LINK**
Model	N1 Wireless Modem Router	Wireless-N Nfiniti ADSL2+ Broadband Modem Router	DKT-810 Router and Wireless Adapter
Price (DSL version, cable version)	£179.99, £99.99	£90.48, £51.70	£119, £96.08
Type reviewed	DSL	DSL	DSL
Sales telephone	01933 352 2000	01344 381 700	020 8955 9000
URL	www.belkin.co.uk	www.buffalotech.com	www.d-link.co.uk
SPECIFICATIONS			
ADSL2+ modem built in	✔	✔	✔
USB wireless adapter included	✘	✘	✔
DSL filter included	✔	✘	✔
802.11a/b/g	✘/✔/✔	✘/✔/✔	✘/✔/✔
802.11n draft version	2.0	1.0	Not specified
WEP/WPA-PSK/WPA2-PSK	✔/✔/✔	✔/✔/✔	✔/✔/✔
Number of network ports (speed)	4 (10/100)	4 (10/100)	4 (10/100)
Nat/SPI firewall	✔/✔	✔/✔	✔/✔
VPN support	✔	✔	✔
DHCP server	✔	✔	✔
UPnP compliant	✔	✔	✔
DDNS support	✔	✔	✔
Application-based QoS	✘	✔	✘
Protocol/Port-based QoS	✘/✘	✔/✔	✔/✔
Frequency band	2.4GHz	2.4GHz	2.4GHz
Number of antennas	3	2	3
Multiple SSID	✘	✘	✔
One-touch security setup	✘	✔	✘
Parental controls	✔	✘	✔
Time-based usage control	✔	✘	✔
Website logging	✘	✘	✘
URL content filtering	✘	✘	✘
IP filtering	✔	✘	✘
PCI adapter price	£69.99	£60	£45
USB adapter price	£69.99	£43	£57.18
Warranty	Lifetime	Two years	11 years
Dimensions cm (wxdxh)	23.7x18x3.3	16.8x17x3	22x15x3.2
Weight (kg)	0.57	0.37	0.61
SCORES			
Features	★★★☆☆	★★★☆☆	★★★★☆
Performance	★★★☆☆	★★★☆☆	★★★☆☆
Value for money	★★★☆☆	★★★★★	★★★★★
OVERALL	★★★☆☆	★★★★☆	★★★★☆

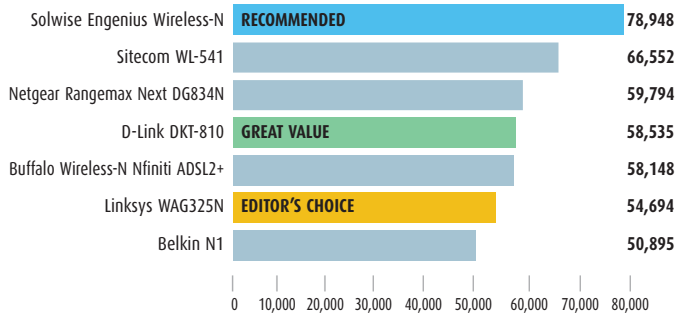
	LINKSYS	NETGEAR	SITECOM	SOLWISE
	Wireless-N ADSL2+ Gateway WAG325N	Rangemax Next Wireless-N Modem Router DG834N	Wireless Network 300N Router	Engenius Wireless-N Gigabit Router
	£99.99, £89.99	£99.99, £69.99	N/A, £119.99	N/A, £108.95
	DSL	DSL	Cable	Cable
	0800 068 0327	01344 458 200	0905 830 0102	0845 458 4558
	www.linksys.com	www.netgear.co.uk	www.sitecom.com	www.solwise.com
	✔	✔	N/A	N/A
	✘	✘	✔	✘
	✔	✔	N/A	N/A
	✔/✔/✔	✘/✔/✔	✘/✔/✔	✘/✔/✔
	1.0	1.0	Not specified	2.0
	✔/✔/✔	✔/✔/✔	✔/✔/✔	✔/✔/✔
	4 (10/100)	4 (10/100)	4 (10/100)	4 (10/100/1,000)
	✔/✔	✔/✔	✔/✔	✔/✔
	✔	✘	N/A	N/A
	✔	✔	✔	✔
	✔	✔	✔	✔
	✔	✔	✔	✔
	✔	✘	✘	✔
	✔/✔	✘/✘	✘/✔	✔/✔
	2.4GHz	2.4GHz	2.4GHz	2.4GHz
	3	3 (internal)	3	3
	✘	✘	✘	✘
	✘	✘	✔	✔
	✔	✔	✔	✔
	✔	✔	✘	✔
	✘	✔	✘	✔
	✔	✔	✔	✔
	✘	✘	✘	✔
	£49.99	£63.99	£44.99	N/A
	£49.99	£69.99	£44.99	£41.76
	Three years	Two years	10 years	10 years
	18.8x17.6x4	3.8x17.2x22.6	19.2x10x2	16.8x10x2.3
	0.53	0.56	0.29	0.3
	★★★★★	★★★★☆	★★★★☆	★★★★★
	★★★★☆	★★★☆☆	★★★★☆	★★★★★
	★★★★★	★★★★★	★★★★☆	★★★★☆
	★★★★★	★★★★☆	★★★★☆	★★★★★

Lab results

All our tests were performed under the same conditions, but it's important to understand that performance will vary depending on the test environment

Short distance: Fixed block size

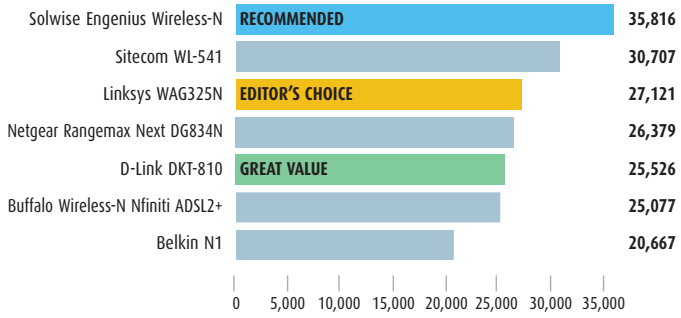
Bigger is better



This test was performed at a distance of just one metre between the laptop and the router. The Solwise Engenius streaked ahead of the pack with an impressive 78.9Mbits/sec.

Short distance: Variable block size

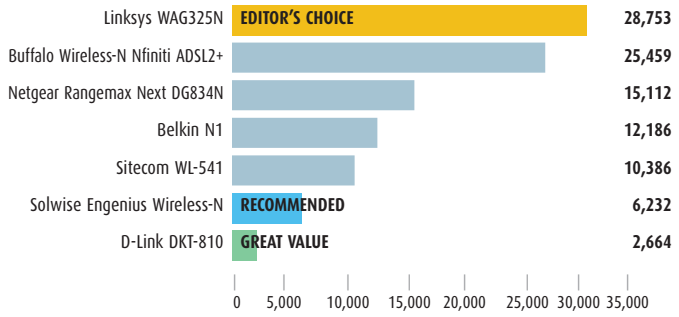
Bigger is better



Under the same short-range conditions, we repeated the test but with a variable block size. As you can see, this affects performance a great deal, but the Solwise still tops the table.

Long distance: Fixed block size

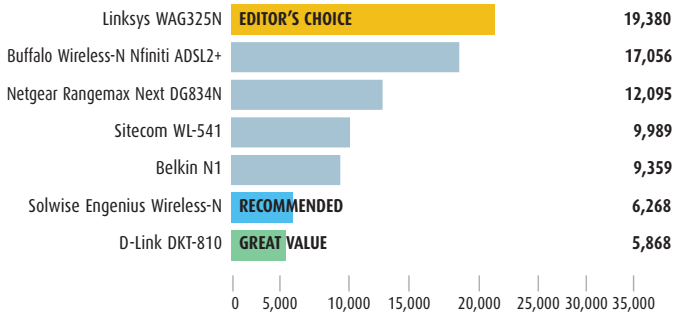
Bigger is better



In our long-range test, with the router and laptop roughly 25m apart, Linksys' bizarre-looking router outperformed the rest, managing an impressive 28.7Mbits/sec.

Long distance: Variable block size

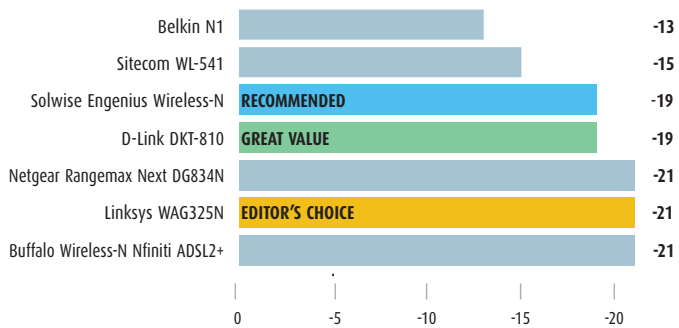
Bigger is better



Switching to the variable block size but keeping the distance of 25m between the router and the laptop, the Linksys router still managed to beat the rest convincingly.

Short distance: Signal strength (dB)

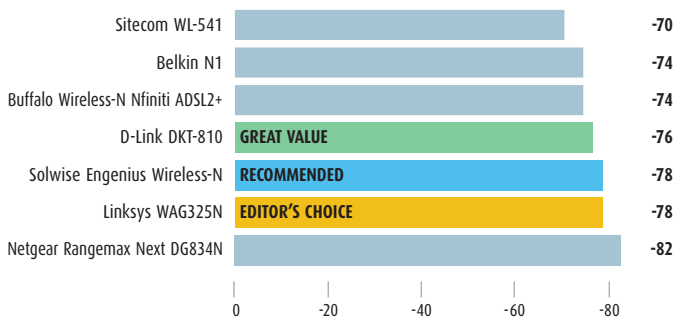
Smaller is better



Belkin's N1 grabs top spot in our short-range signal strength test with -13dB, but the others aren't far behind with the Netgear, Linksys and Buffalo bringing up the rear at -21dB each.

Long distance: Signal strength (dB)

Smaller is better



With the router and laptop around 25m apart, signal strength takes a massive hit. The Sitecom does best at -70dB, but once again the rest report very similar figures.

How we tested

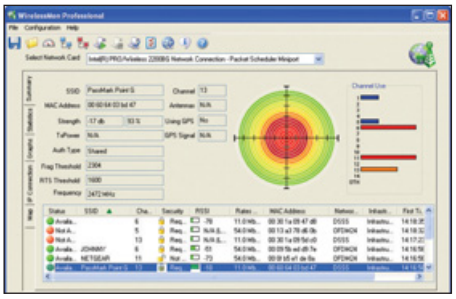
Draft-N devices are often quoted as providing speeds of up to 300Mbits/sec, but this is the link speed, not the real-world throughput, which is always much lower than this.

Many factors can influence performance: transmission range, interference from other networks and devices and obstacles such as walls all have a negative effect on network speed.

To test the routers, we used Performance Test 6.1 from Passmark (**www.passmark.com**). This software includes a network test that can stream data directly between two PCs on a network using various block sizes and protocols and avoiding possible bottlenecks such as slow hard drive performance.

We wanted to ensure minimal interference, so we used another program from Passmark, Wirelessmon, to monitor signal strength as well as the presence of other wireless networks that could interfere with our results. It also gave us a signal strength measurement.

We tested performance in two locations. The first was just one metre away from the router while the second was in another room across a hallway. In each location we tested throughput in both directions using fixed and variable block sizes.



We used Performance Test 6.1 from Passmark to test the routers

To ensure the best possible performance, transfers took place between a notebook PC on the wireless network and a desktop system connected via a wired link direct to the router.

To mimic the recommended setup for home or business use, we enabled WPA2 encryption – while this does incur a small performance penalty we feel it's closer to real-world usage and therefore will provide more useful results.

Where possible, we tested each router with the manufacturers' own matching USB wireless adapters. Where these were not available, we tested with two adapters from other manufacturers using different wireless chipsets and recorded the best score.

Editor's Choice

Editor's Choice Linksys WAG325N Recommended Solwise Engenius Wireless-N Gigabit Router Great value: D-Link DKT-810

Linksys WAG325N

Solwise Engenius Wireless-N Gigabit Router

D-Link DKT-810

The selection of wireless routers in this group test not only showed differences in performance, but also in features and complexity, which in turn affects ease of use.

Perhaps the first decision you need to make is what type of router is best suited to your broadband connection. If your broadband is supplied via ADSL, then it makes economic sense to choose a model with a built-in ADSL modem – it also saves on clutter and wiring. However, the latest innovations and newest routers seem to be made available first as straight broadband routers with no modem included. If you want Gigabit Lan ports or dual-band wireless networking, then these products aren't yet available as modem routers.

If you're a cable broadband user, you can buy a less expensive router and attach your existing Ethernet modem to it. All the modem routers we've reviewed here have non-modem versions available too. ADSL users can also take advantage of these lower-cost routers if they have, or are willing to buy, an Ethernet ADSL modem – these are available for around £30.

This means that our suggested products for ADSL and cable users are not the same. If you want the ultimate in performance and configurability then we recommend the Solwise Engenius Wireless-N Gigabit Router. It's rather pricey for a product with no modem, but it delivered the best wireless performance and has gigabit network ports, enabling the fastest possible speeds from both your wired and wireless devices. It also provides highly sophisticated filtering and parental control options in what is physically the smallest product in the group test.

For less power-hungry users, there is better value for money to be had. Buffalo's Wireless-N Nfiniti ADSL2+ is a low-cost option and a solid performer. If you already have an Ethernet modem, then the modem-free version is available for an astonishingly low £52.

However, for DSL users D-Link's DKT-810 kit costs just a little more than most other modem routers, but has a USB wireless adapter thrown in. It therefore receives our Great Value award.

Our Editor's Choice award goes to the Linksys WAG325N. If you can see beyond its unconventional looks, you'll find a rich feature set that's more than powerful enough for both home and office use combined with solid performance that becomes excellent over longer distances. **PCW**

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A case of gaming

Simon Crisp takes a look at six of the best cases to house your gaming PC

Akasa Eclipse: has a collection of great features

They used to be dull, beige boxes that didn't warrant a second look after you pressed the power button, but today a PC case is as much a style statement as it is something to hold your PC's internal workings.

Ranging from something not much bigger than the diameter of a DVD, right up to massive server tower systems, there are cases to match all manner of budgets from the £20 value models all the way up to custom-painted cases costing more than £600.

In this group test, we're concentrating on gaming cases. With extra cooling features and designs that make it easy to add new components, these cases are perfect for those who demand more from their PC.

Akasa Eclipse-62 V2

This Akasa model might look like any other black case when you take it out of the box, but delve a little deeper and you'll soon change your mind. Akasa has included a collection of great features aimed squarely at enthusiasts.

With its aluminium construction both inside and out, the polished stainless steel removable motherboard backplate is a real eye-catcher. It might look like a weighty beast, but at just 9kg it's actually very light. Probably the most interesting feature is the I/O expansion plate built into the case front.

Personal Computer World EDITOR'S CHOICE

Accessed by flipping open a door, this lets you provide quick access to the large number of plate-mounted extra ports you have with today's motherboards. All panels, including the roof, are removable, making adding extra components, such as water-cooling, incredibly easy.

Akasa has also given some thought to the power supply mount which is long enough to support even Enermax's mammoth Galaxy series of PSUs and there is a movable bracket to keep the PSU firmly in place.

Antec Nine Hundred

Best known for making a range of quiet cases, Antec's Nine Hundred is its first chassis aimed at gamers. The first thing you'll notice is the striking look, which stands out from the crowd thanks to its angled design at the top.

If that doesn't grab your attention, then the roof mounted 200mm cooling fan certainly will – thanks to its extra large size it can run slower and therefore quieter, while still keeping everything cool.

It's not as innovative as the company's Sonata cases, with the major surprise being the small number of tool-free components; only the case's side panels and the drive cages use thumbscrews.

The cages are removed by pulling them out through the front bezel, which is an unusual design with each one holding three bays along with a three-speed 120mm fan built into the front; the speeds are controllable by a small switch. Although the drive mounts aren't tool free, they are separated from the cage frame by plastic spacers which help reduce case noise caused by the vibrations of hard drives.

Antec Nine Hundred: Angled design is striking

Coolermaster Cosmos: With temperature probes

Coolermaster Cosmos 1010

The 1010 is the latest version of Coolermaster's unmistakeable Cosmos tower case.

With the Cosmos 1010, Coolermaster has taken away the ducting for the negative pressure cooling and added support for ESA (Enthusiast System Architecture). ESA is an open standard PC monitoring and control utility that shows system information and allows ↘

NZXT Lexa Classic: Battlestar Galactica-style look

overclocking of most of the system components to be performed through a Windows-based interface. To this end, the case comes with four temperature probes: CPU, GPU, hard drive and a spare which you have to remember to fix in place as you're building your system.

As far as features go, the 1010 is the same as its sibling, which unfortunately includes the fixed motherboard plate. But since there is so much room to work inside the case thanks to the sheer size of it, this isn't such a problem.

NZXT Lexa Classic

The Lexa Classic looks like it belongs on the original Battlestar Galactica set as its front panel has the look of a Cylon about it. It's also the lightest case to feature in this roundup, weighing in at just 5.8kg (without a power supply). Unsurprisingly, its lightweight nature means it's aimed at those who frequently attend Lan parties – it even comes complete with a carrying strap.

The reason for its low weight is the fact that, apart from the plastic front bezel, the whole case is constructed from aluminium. However, it doesn't feel as robust as the Akasa or Zalman.

The base of the case doesn't sit flat on a surface but is raised up by extensions to the front and rear of the case to allow air to be drawn up through the base of the case and over

'Today a PC case is as much a style statement as it is something to hold your PC's internal workings.'

internal components by the fan in the case top. Built into the matching top front extension is an LCD which shows CPU, hard drive and system temperature.

Thermaltake Xaser V1

This Xaser VI is a well-built case and one that houses a good number of tool-free features along with plenty of drive bay space. It does, however, have two frustrating niggles – both of which could so easily been avoided.

Firstly, the fact that the case side panels are held on by thumbscrews is great, but they are of a very small diameter. Due to the side panel design, they're also incredibly awkward to get to if you have big fingers, which is especially annoying if you want to remove both panels to allow the motherboard plate to be removed. And this leads us to our second grumble: the motherboard plate is held in place by four tiny screws. This seems like a very odd decision – thumbscrews would have been so much easier and it's even more frustrating when Thermaltake takes the time to build in a handle to make the backplate easier to pull out.

It's not a bad case overall, though, and a neat touch is a movable power supply brace, which means no matter what the physical size of PSU you buy it can be supported from underneath.

Thermaltake Xaser V1: A well-built case but the side panels use tiny thumbscrews

Zalman Z-Machine GT900

The first things that strike you about the GT900 from Zalman are the build quality and the price tag; the former is very impressive while the latter makes you wince.

Built from 5mm black anodised aluminium, the whole case is screwed together with not a single rivet in sight. The reason behind this choice of materials is due to Zalman treating the whole case as a heat-sink to aid in the cooling of the PC internals.

Zalman Z-Machine GT900: Great build quality but at an eye-popping price

As a result of this there is no motherboard plate as such – instead the board mounts directly on the case side, with the mounts already in place. The side plate is removable, held in place by Allen screws (an Allen key is included).

The 3.5in drive bay cage, mounted at a right angle to the case, comes with rubber rollers to help putting in and taking out the drives, as well as cutting down vibration once installed. It even has vibration-deadening feet similar to those fitted to hi-fi systems.

MANUFACTURER	AKASA	ANTEC	COOLERMASTER	NZXT	THERMALTAKE	ZALMAN
Model	Eclipse-62 V2	Nine Hundred	Cosmos 1010	Lexa Classic	Xaser VI	Z-Machine GT900
Price	£92.38	£72	£139.83	£84.59	£164.49	£239.99
Telephone	020 8578 0055	n/a	n/a	n/a	n/a	n/a
URL	www.akasa.co.uk	www.antec.com/uk	www.coolermaster.com	www.nzxt.com	www.thermaltake.com	www.zalman.com
Available from	www.scan.co.uk	www.yoyotech.co.uk	www.scan.co.uk	www.chillblast.com	www.overclockers.co.uk	www.quietpc.com
SPECIFICATIONS						
Case style	Midi-tower	Midi-tower	Full-tower	Midi-tower	Full-tower	Midi-tower
3.5in drive bays hidden/external	4/2	6/0	6/1	5/2	7/0	1/4
5.25in drive bays	4	3	5	4	7	4
Clear side panel	Option	✔	✘	✔	✔	✔
Removable m'board backplate	✔	✘	✘	✘	✔	✔
Tool-free side panels	✔	✔	✔	✘	✔	✔
Tool-free drive bays	✘	✘	✔	✔	✔	✘
Tool-free m'board plate	✔	✘	✘	✘	✘	✘
Tool-free expansion plates	✔	✘	✔	✔	✔	✔
Cooling fans	2x 120mm	1x 200mm, 3x 120mm	5x 120mm	3x 120mm, 1x 80mm	3x 120mm	1x 120mm, 2x 92mm
Additional fan mounts	✘	1x 120mm	1x 120mm	✘	✘	✘
Sound proofing included (location)	✘	✘	✔ (side panels)	✘	✘	✘
Rear panel drilled for water cooling	✘	✔	✔	✘	✔	✘
Power supply (location)	✘ (top)	✘ (bottom)	✘ (bottom)	✘ (top)	✘ (top)	✘ (top)
Construction	Aluminium with plastic front bezel, stainless steel m'board plate	Steel with plastic front bezel	Steel	Aluminium with plastic front bezel	Aluminium with plastic detailing	Aluminium
Inputs/outputs	2x USB2, 1x I/O plate	2x USB2, 2x audio, 1x Firewire	4x USB2, 2x audio, 1x Firewire, 1x eSata	2x USB2, 2x audio, 1x Firewire	4x USB2, 2x audio, 1x Firewire, 2x eSata	2x USB2, 2x audio, 1x Firewire
Dimensions mm (wxdxh)	240x560x460	269x467x493	266x628x598	220x569x522	250x605x660	220x480x430
Weight	9kg	8.4kg	16.9kg	5.8kg	11kg	12.4kg
SCORE	★★★★½	★★★★½	★★★★½	★★★½☆	★★★★½	★★★★½

Editor's Choice

Editor's Choice Akasa Eclipse-62
Recommended Coolermaster Cosmos 1010

Akasa Eclipse-62

Coolermaster Cosmos 1010

'...it's testimony to its design that the Eclipse-62 still holds up well against some stiff competition'

Deciding which case is best for you will depend on a number of factors, including your requirements and personal taste. If you don't have many drives, but also have a large budget, then the Zalman GT900 is hard to beat purely because of the quality of materials used and its stunning build quality. Both the NZXT and the Coolermaster Cosmos 1010 have their good points, including system monitoring, while if you have a host of drives that need a home then the Cosmos or the Thermaltake Xaser X1 are the ones to consider.

The Thermaltake does have some issues which could have been so easily sorted, which is a shame, leaving the Coolermaster Cosmos 1010 to pick up our Recommended award.

Meanwhile the Antec Nine Hundred and the Akasa's Eclipse-62 are both what you could best describe as standard gaming cases – nothing fancy, but they do the job well. Both suffer from a lack of tool-free components, but it's testimony to its original design that the Eclipse-62 still holds up well against some stiff competition.

The fact that the whole case, including the roof, comes apart, along with its easily-removable motherboard plate make it ideal for enthusiasts and modders alike. The Akasa Eclipse-62 therefore picks up our Editor's Choice award.

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BUSINESS

VIRTUES OF VIRTUALISATION

Virtualisation is a key technology for companies wanting to consolidate and make the best use of their hardware resources. In this month's Business section we compare three leading server virtualisation packages designed specifically for use by small businesses. Each can be downloaded and used for free, and all offer production-quality virtualisation, but there the similarities end as you'll find out starting on page 118.

Continuing the virtualisation theme, we also take a look at the latest addition to Microsoft's System Center management family, Virtual Machine Manager 2007.

Beyond that we've a review of a low-cost data backup utility from Yosemite Technologies, which offers continuous protection and which we found remarkably easy to use. Plus we give you our verdict on a new small-business colour laser from Xerox, a Linksys professional surveillance camera and an impressive HP scanner aimed at companies needing intelligent high-volume document capture.

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118 No matter how many servers you're looking to make better use of, virtualisation can be a valuable and cost-effective tool

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OUR SCORING

Excellent ★★★★★ Very good ★★★★☆ Good ★★★☆☆ Below average ★★☆☆☆ Poor ★☆☆☆☆

OUR AWARDS

Editor's Choice: The best product in a comparative group test. Anything that wins this award is of better quality than its competitors.
Recommended: A product that combines great features, usability and value for money.
Great Value: Not the best in class, but a product that has superior features and performance for the price.

Editor's Choice Business

Recommended Business

Great Value Business

The business awards are used for products that are more suited to home offices or small businesses.

'Virtualisation has many benefits for small businesses and there are plenty of products available'

Read the feature on page 118

Virtual servers

It doesn't matter whether you're looking to make better use of one, two or a whole rack of servers, virtualisation can be a valuable and cost effective tool. Alan Stevens reports

As we've discussed in *PCW* Business over recent months, virtualisation has many benefits for small businesses and there are plenty of products available, whether you want to move old hardware to a newer platform, test a new operating system or maximise your return on investment. The market is dominated by three vendors, the leader being VMWare with a range of products including the free VMWare Server. Next comes Microsoft and Virtual Server 2005 R2, followed by Citrix, which recently became the proud owner of Xenserver, a commercial implementation of the open-source Xen virtualisation technology.

All of these are marketed as suitable for use by small businesses and all can be downloaded and used free of charge. Which is exactly what we did for this group test, to see just how they measure up.

Virtual Server 2005 R2 SP1

Until Microsoft's hypervisor platform (Hyper-V) launches, Virtual Server 2005 R2 remains the company's principal server virtualisation platform. It can be run on both 32-bit and 64-bit processors with, in the latest SP1 version, full support for Intel-VT and AMD-V technologies, although these aren't a prerequisite.

Windows, of course, needs to be installed on the host server and Windows Server 2003 is the preferred choice. Go for a 64-bit implementation and the virtual machine limit rises from 64 to 512 VMs per server, while memory is enhanced from 3.6GB per VM to 256GB.

However, it's important to note that regardless of host processor you can only run 32-bit guests, and you're only allowed one virtual processor per virtual machine.

Deployment is very straightforward – simply make sure the host server is running IIS, and install the software using the setup wizard provided. That done, you create, run and manage virtual machines from a browser with an ActiveX component provided for remote control. SSL encryption can also be enabled, with user authentication managed via Active Directory and multiple servers managed via System Center Virtual Machine Manager if preferred.

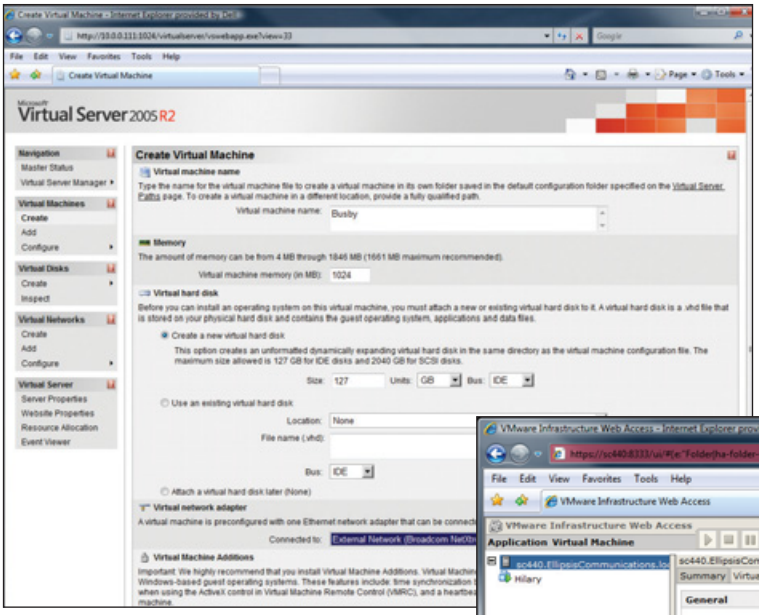
Guests can be either Windows or Linux with Virtual Machine Additions packs provided to enhance the performance and functionality of both. However, Vista is only supported for non-production use and the number of officially supported Linux platforms is strictly limited.

We found the Microsoft software very easy to manage. Virtual machines can be created from scratch, copied and moved and there's a separate tool available to migrate existing physical servers, complete with all their settings and applications. We also liked the ability to fine-tune the setup, by weighting the VMs or by allocating each a fixed percentage of processing power.

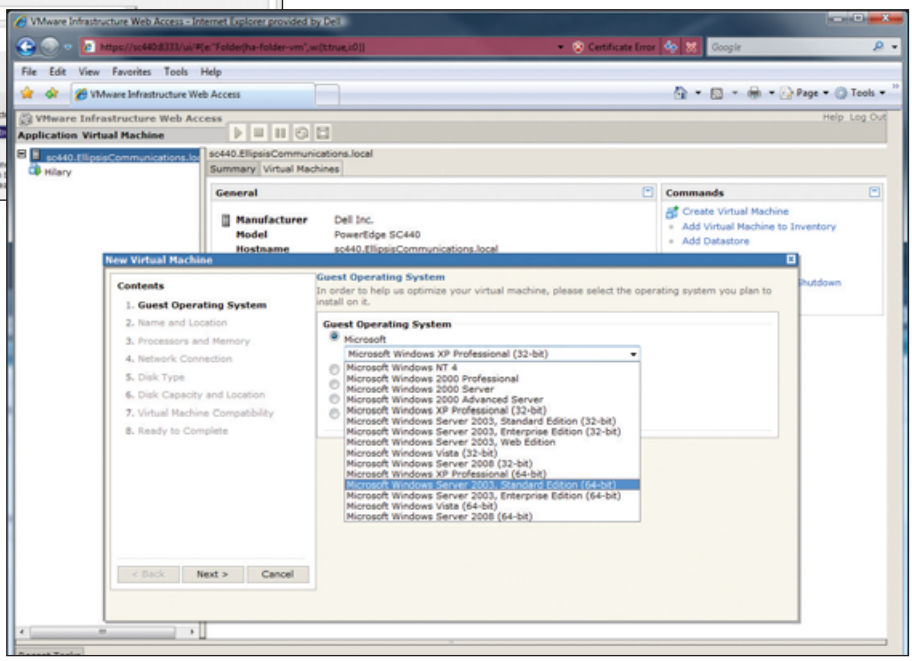
Another useful facility is the ability to mount and access virtual hard disks offline, without having to start the associated VM. Support for Volume Shadow Copy Service has now been added in the SP1 release, making it possible to back up active virtual machines, but there are no live migration facilities as in Xenserver Enterprise.

VMWare Server 2.0

One of the big advantages of VMWare Server is that it can be hosted on both Windows and Linux servers. These can have 32-bit or 64-bit processors and there's support for both



Microsoft's Virtual Server 2005 R2 SP1 software runs on a Windows server but can be managed remotely from a web browser



A browser-based console is used to create and manage virtual machines on VMWare Server 2.0

Intel-VT and AMD-V virtualisation extensions, although neither is an absolute prerequisite unless you want to support 64-bit guest operating systems.

The software we reviewed was a beta version of VMWare Server 2.0, due out in mid-2008, although for production use we'd advise sticking with the 1.0 release, which is a much more stable implementation.

Any version of Windows can host the VMWare Server, from Windows 2000 onwards, with support for Windows Server 2008 in the 2.0 release.

Alternatively there's extensive support for Linux hosts with Red Hat Enterprise Linux (RHEL) 5.1, and the latest Novell SUSE and Ubuntu distros also supported. Likewise, there's an extensive list of guest operating systems including Sun Solaris and a range of Windows and Linux implementations

'All of these are marketed as suitable for use by small businesses and can be used free of charge'

with Vista Business and Ultimate editions recently added, along with Windows Server 2008 and RHEL 5.

Other enhancements in the latest version include the ability to configure virtual machines with up to 8GB of Ram (you're limited to 3.6GB in VMWare Server 1.0) and up to 10 virtual network adapters.

Two-way virtual SMP is available in both implementations and you can have up to 64 virtual machines per host in Server 2.0, with support for high-speed USB2 devices another new feature.

Tools to convert physical servers to virtual machines are also available and there are lots of ready-made appliances available in VMWare format. Installation is pretty straightforward but there's a big change in the way the product is managed. In Server 1.0 a Windows console is used to create, manage and run virtual machines, with an optional cut-down web interface if required. In VMWare Server 2.0 these are replaced by a single browser-based console which is relatively easy to get to grips with but, in our eyes, not quite as slick as the old GUI. We also encountered a few bugs yet to be addressed in the beta program.

Xenserver v4

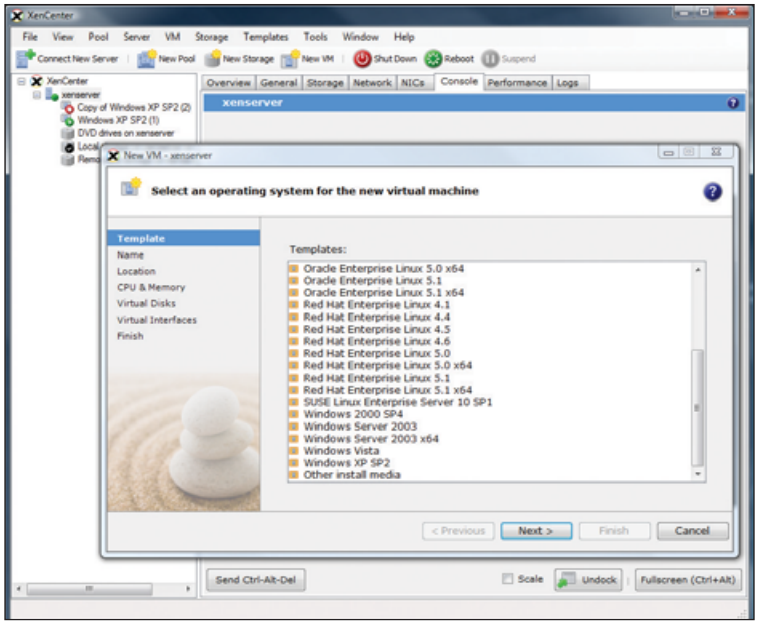
Xenserver differs from the other two products here in that it's a hypervisor, which means you don't need a host operating system on the server to start with. Just pop the install CD into a bare machine, boot, and you can load up all the software needed to host Windows and Linux virtual machines.

The Xenserver hypervisor is a 64-bit implementation, so you'll need a server with one or more 64-bit processors, although virtual machines can run either 32-bit or 64-bit software. Intel-VT and AMD-V processors are required in order to run Windows guests, with support for Windows 2000 SP4, XP and Server 2003 plus most leading implementations of Linux as standard. Vista (32-bit only) is also available in the 4.1 beta we tested, with scalability and functionality enhancements also in this update, which is expected to ship by mid-year.

Three versions are available, starting with a free Express Edition. This is fine for the small business but is limited to just two physical processors and 4GB of memory, and will only support four active guests, so larger customers will need one of the other editions.

Upgrade to the Standard or Enterprise editions and there are no processor limits and each server can have up to 128GB of Ram with up to 32GB per VM. The Enterprise edition can also make use of shared iSCSI or Nas storage and includes a tool called Xenmotion which allows virtual machines to be migrated between servers while running. But they're not cheap – a two-socket Standard Edition licence with support, for example, starts at $600 (around £300) per year.

A Windows based Xencenter application is used to remotely manage Xenserver, with multi-server management and pooling in the ↘



Xenserver is a 64-bit hypervisor that can be installed onto a bare server to host a variety of 32-bit and 64-bit virtual machines running Windows and Linux

paid-for editions. We found it reasonably intuitive, but we preferred using Remote Desktop to access Windows guests rather than the built-in Xencenter Console.

On the plus side, creating new VMs from the templates provided is quick and easy, and you can configure your own. There are plenty of networking options and virtual machines can be backed up, copied and cloned. There's also a physical-to-virtual conversion tool for use with Linux hosts. Dell is also starting to ship Xenserver as an embedded application on its Poweredge servers, and Microsoft VHD compatibility is another useful feature.

Editor's Choice

Choosing between the virtualisation platforms in this group test is far from easy. All are very capable and could be successfully deployed by any small business, but there are important limitations and differences.

Microsoft's Virtual Server 2005 R2 SP1, for example, requires a fully licensed Windows host and can only run 32-bit guests. On the plus side, these can be Linux or Windows, and the browser-based management interface is nice. It's also possible to mount virtual hard disks independently and you'll be able to migrate virtual machines to the new Hyper-V platform when it ships. If you have a spare Windows server and can live with the limitations it's worth considering, otherwise we'd give it a miss.

VMWare Server, on the other hand, can be hosted on Linux as well as Windows servers and supports 64-bit as well as 32-bit guests. You also get two-way virtual SMP and support for USB2 within VMWare virtual machines – features which simply aren't available in the Microsoft package. However,

> 'Choosing between the virtualisation platforms in this group test is far from easy. All are very capable'

the latest VMWare Server 2.0 is still only available in beta format and not yet recommended for production use. VMware Server 1.0 is worth considering as a substitute, but isn't as functional, so our recommendation and Editor's Choice award goes to Xenserver v4 from Citrix.

As a hypervisor, Xenserver delivers maximum performance without the need for a host operating system or the associated cost. It also supports 64-bit guests and, although the free Express Edition is limited to four concurrent VMs, it's man enough for a lot of small business needs.

We also found Xenserver easy to install and operate, making it a good choice for small companies on a budget. **PCW**

Virtual servers

Product name	Virtual Server 2005 R2 SP1	VMWare server 2.0	Xenserver v4
Price	Free download	Free download	Free download (Express Edition only)
Supplier	Microsoft	VMware	Citrix Systems
Phone	0870 601 0100	01276 414 300	01753 276 200
Website	www.microsoft.co.uk	www.vmware.com	www.citrix.co.uk
Requirements	32-bit or 64-bit processor, Intel-VT and AMD-V supported but not required, minimum 256MB Ram (2GB or more recommended), Windows Server 2003 host (XP can be used for testing)	32-bit/64-bit processor, Intel-VT and AMD-V optional, 512MB Ram (2GB recommended), host can be any version of Windows Server or one of several Linux distros	64-bit processor, Intel-VT and AMD-V required for Windows guests, 1GB Ram, no host operating system required
Pros	Free download, 64-bit and multi-processor support, VHD mount option, virtual disk resizing and VM snapshot facility Windows and Linux guests	Windows or Linux hosts, wide choice of guests, virtual SMP, 64-bit guests, USB2 interface	Hypervisor 64-bit virtual machines, Windows and Linux guests, live migration (Enterprise edition)
Cons	Windows host only, no support for 64-bit guest operating systems, one processor per VM, limited Linux support	Server 2.0 still in beta at time of writing	Free Express Edition limited to two processors and four concurrent guests
Overall	A capable virtualisation platform but reliant on a Windows host and can only run 32-bit uni-processor guests	Still one of the best free server virtualisation platforms around, but stick to the 1.0 release until VMWare Server 2.0 is fully available	With no host operating system required, the Xenserver hypervisor is a good choice for small businesses looking to get top notch server virtualisation at minimal cost
Features	★★☆☆☆	★★★☆☆	★★★★☆
Ease of use	★★★☆☆	★★★☆☆	★★★☆☆
Value for money	★★★★☆	★★★★☆	★★★★☆
Overall	★★★☆☆	★★★★☆	★★★★☆

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FSPLifeStyle.com

DOCUMENT SCANNER

HP Scanjet N8460

Speed up document capture with this high-volume desktop scanner

Imposing to look at, the Scanjet N8460 and bundled software together deliver impressive high-volume document capture facilities

With an 'N' in the model number you could be forgiven for thinking the Scanjet N8460 is a network scanner, like the Canon Scanfront 220 we reviewed in February's Business section (see **www.pcw.co.uk/2206281**). However, that's not the case. Instead of plugging into the Lan it needs to be connected directly to a host PC.

Still, it's no ordinary desktop scanner, as the £1,153 ex Vat price implies, but a high-speed, high-volume document capture appliance designed to scan up to 1,500 documents per day.

If prizes were awarded for size, the Scanjet N8460 would be a front runner as it's a real beast of a machine. The main component is a legal-size flatbed scanner capable of scanning in colour (48-bit) at up to 600dots per inch (dpi). On top of this sits a large automatic document feeder (ADF) that can take up to 100 sheets at a time. The ADF also features an ultrasonic double-feed detector so that if more than one sheet starts to feed, everything stops and you're notified to go and sort it out.

Host connectivity is via a USB2 port at the side while the controls are spread out along the front with a small LCD panel plus an array of buttons. These include a customisable set of Quick Start buttons that can be configured to run user-defined scan profiles. For example, you can set up a button to scan to a PDF or editable Word document, so you don't have to configure everything from scratch each time.

Software is, of course, needed on the host PC to enable this to happen, with a large bundle of CDs included in the box.

The principal application here is HP's Smart Document Scan Software (SDSS), an Isis-based application able to capture documents in a variety of graphics and text formats. Along the way it can also resize, straighten and crop images, reorder and rotate pages and generally enhance the content using Kofax Virtual Rescan (VRS) technology.

Readiris Pro optical character recognition (OCR) software is also included to generate editable text from scanned documents and Scansoft Paperport to file and manage the documents produced. All of which takes a while to get to grips with, although we found the different tools easy enough to use and only a modicum of training is likely to be required by most users.

Alternatively, Isis and Twain driver are available for integration with other document scanning and management applications.

Throughput is dependent on the type of document being scanned, resolution and scanned file format. However, with standard A4, black and white documents scanned at 200dpi and saved as TIFF files the N8460 can manage an impressive 35ppm. It can also scan both sides at once, effectively doubling that rate to 70ipm (images per minute). High-resolution colour scans take appreciably longer, but it's still pretty quick even then and capable of handling a range of paper sizes and document types with ease.

Whether you can really justify spending this amount of money on a scanner is going to depend on what you want to use it for. If it's ad hoc scanning you're after, there are lots of cheaper products around which, although slower and less robust, will give equally good results.

However, for fast, high-volume document capture the Scanjet N8460 is priced to compete with similar products from other vendors and, as such, could well be worth the otherwise high price. *Alan Stevens*

Verdict

Pros Fast and robust duplex scanning; double-feed detection; customisable Quick Start buttons

Cons Bulky; no direct network connection; expensive if only used for ad hoc scanning

Overall It's big and expensive compared to some desktop scanners, but it's a good buy for use with high-volume data capture applications

Features	★★★☆☆
Performance	★★★★☆
Value for money	★★★☆☆
Overall	★★★☆☆

Price £1,355 (£1,153 ex Vat)

Contact HP 0870 241 3625 www.hp.com

Specifications 600dpi CCD colour flatbed scanner • 100-sheet ADF • Duplex scanning • Maximum throughput 35ppm/70ipm • 1,500 scans per day duty cycle • USB2

COLOUR LASER PRINTER

Xerox Phaser 6125

Compact and built to a price, but does this printer make the business grade?

Xerox makes big claims of its new Phaser 6125, which it believes is ideal for small offices and workgroups looking for an affordable colour laser. And for a network colour printer it's certainly cheap to buy, with some online resellers discounting it to as little as £169 ex Vat or less. But then you only get what you pay for, and what you get with the Phaser 6125 is a little disappointing.

The basic specifications are all well and good with, at the heart of the printer, a single-pass laser engine capable of spitting out documents in full colour at up to 12pages per minute (ppm) and 16ppm for black and white. Print resolution is 600dpi and, although not the best quality we've seen, this is acceptable for a printer at this price. The device itself is also very compact and quiet to use, with a built-in 250-sheet A4 paper feeder and easy-change consumables in the form of four separate toner cartridges that snap into place behind a door on the side.

There's a small, but easy-to-use LCD control panel at the front and, as well as a USB2 interface for local connectivity, there's a built in 10/100Mbits/sec Ethernet port for remote printing plus an integrated web server to manage the printer.

A 333MHz processor drives the electronics, supported by 64MB of non-expandable memory and in our tests the first page of most documents would start to print in around 15 to 20 seconds. Not earth shattering, but reasonable.

However, the rest of the specification isn't quite as good. To start with there's no duplexer for double-side printing, not even as an add-on. And you can't add any extra paper trays, with the manual feeder only taking one sheet at a time. Envelopes and labels can be fed in via the A4 tray, but it's an awkward process.

Consumables are likely to be an issue too. Toner comes ready fitted, but the starter cartridges are likely to run out after a mere 500 pages. Moreover, replacements won't last much longer, with colour cartridges expected to average around 1,000 pages each, and black cartridges about 2,000. On the plus side they're not that expensive to buy (around £27 each for cyan, magenta and yellow and £33 for black, ex Vat) but, given their short life, the Phaser 6125 isn't really that cheap to run.

Lastly, it's worth noting that the 6125 is a GDI printer so, instead of using a print language (such as PCL or Postscript) and rendering documents on the printer itself, the driver on the PC that's sending the documents has to do all the work. This reduces the amount of printer memory required, but the local rendering can impact performance.

Suitable Windows drivers come as standard and Linux equivalents are also advertised, although we couldn't find one on the Xerox website, and the GDI approach means that Mac use isn't supported at all. Indeed, if you're at all tempted by this Xerox Phaser, the 6130 (around £230 ex Vat) is arguably a better bet, as it's more or less the same printer but with conventional PCL/Postscript emulation and more, expandable, memory.

The 6130 also benefits from longer-life consumables but then neither Phaser really impresses, and there are plenty of colour alternatives to choose from offering similar performance and a lot more features, for not much more money. *Alan Stevens*

The basic specifications are good and the device is compact, although there are missing features that could cause an issue in the office environment

Verdict

Pros Cheap; fairly quick; networkable
Cons No duplexer; limited paper handling; low-capacity consumables; host-based rendering
Overall An acceptable colour laser for home use, the Phaser 6125 doesn't match what others have to offer the business market

Features	★★☆☆☆
Performance	★★★☆☆
Value for money	★★☆☆☆
Overall	★★☆☆☆

Price £243 (£207 ex Vat)
Contact Xerox 0870 873 4519 www.xerox.co.uk
Specifications 600dpi single-pass colour laser • Up to 12ppm colour/16ppm monochrome • 333Mhz processor • 64MB Ram • Host-based (GDI) rendering • 250-sheet A4 paper drawer • Single-sheet manual feeder • 150-sheet output tray • USB2 and 10/100Mbits/sec Ethernet ports • Integrated web server • Windows drivers

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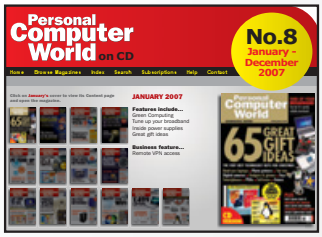

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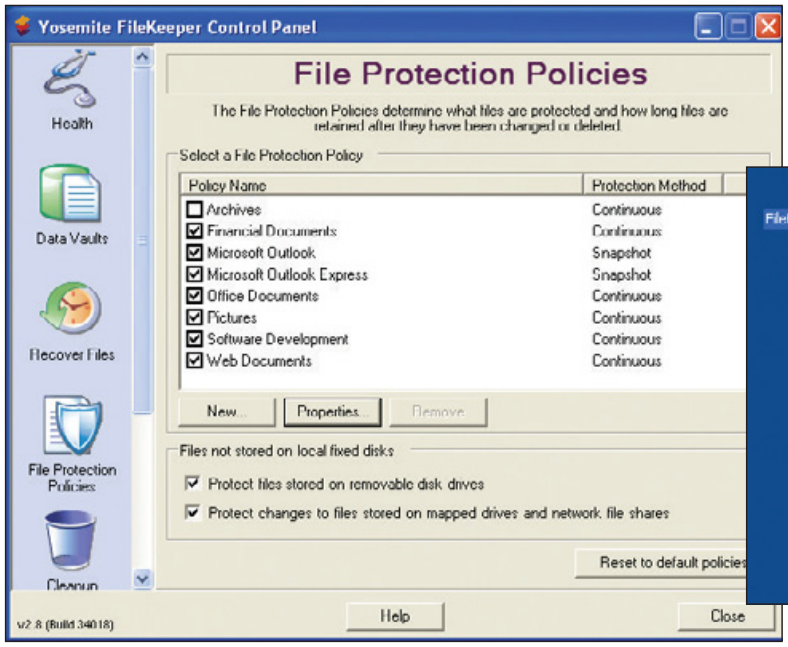

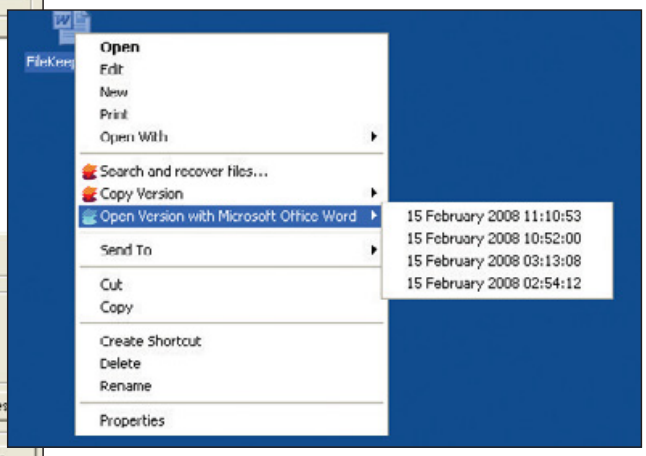

Left: A set of preconfigured file protection policies is included to cope with the most common backup requirements

Below: Simply right-click a protected file and you can open or copy any of the saved versions

We all know how important it is to back up data, but few of us actually do anything about it, often because it tends to be such a complicated and tedious process. However, once you've installed Filekeeper Professional you can leave all the hard work to the Yosemite Technologies software, which will take backup copies in the background every time you change a document or file. The only time you have to get involved is when you want to recover a file or revert to a previous version and, even then, it's pretty easy.

Filekeeper can be installed on any PC running Windows XP or Vista, the only real prerequisite being .Net Framework 2.0. Installation takes just a few minutes during which you're asked to specify the file protection policies to be applied, with a number of preset policies already included to cope with most common scenarios. The default Microsoft Office policy, for example, will continuously protect all your Office documents, keeping each version saved for up to 30 days. Copies of deleted files will be retained for 15 days and these and other settings, such as files and folders to explicitly exclude from the process, can be further customised if required.

The software will also protect your email, by taking a snapshot of Outlook or Outlook Express files every hour, although you can only back up and recover the whole data store, not individual emails. Other open files, including low-transaction databases, can be similarly protected with snapshots and, as well as local files, those on removable and network storage locations also included in the backup process.

By default, the backup copies are held in a hidden version store on the hard disk, Filekeeper only saving changes to minimise the space required and optionally encrypting copies for security. However, that's of little value in the event of crash, so you can also configure one or more extra 'data vaults' to effectively keep backup copies of the version store. These can be kept on removable USB storage, including Flash memory drives or network shares and set to back up the version store automatically or on demand.

A taskbar icon shows when Filekeeper is installed and providing protection with a Windows Control Panel for later changes to the configuration and general management, including the recovery of deleted files. To restore a previous version of a file, however, all you have to do is right-click its icon and either open it from the list of versions presented or take a copy first. There's no special interface to learn and no need to find the right backup media – it's all done for you. A corporate version is also available from $389 (approx £198) for 10 users, adding centralised policy management.

We did encounter a few problems configuring a data vault as, when using a network share, the vault has to be in the root directory, and you have to specify the location using a UNC pathname not a mapped share. Still, that was soon dealt with and, once set up, the product as a whole worked very well, enabling us to recover lost files and undo changes very quickly indeed.

On the downside, the Yosemite software can only protect documents and data files which means making other arrangements to back up Windows and any applications installed. Still, it protects what's most important and we found Filekeeper Professional delightfully easy both to set up and use. *Alan Stevens*

Verdict

Pros Continuous data protection; data vaults can be kept on removable or network storage; simple integrated version recovery

Cons Only protects data files; whole email data store protected not individual emails

Overall An invaluable tool that takes all the hard work out of protecting important documents, email and other data files

Features	★★★☆☆
Performance	★★★★☆
Value for money	★★★★☆
Overall	★★★★☆

Price $29.99 (£15.30)

Contact Yosemite Technologies 020 7183 8183 www.filekeeper.com

System requirements .Net Framework 2.0 • PC running Windows XP or Vista

Cyberpower recommends Windows Vista™ Home Premium

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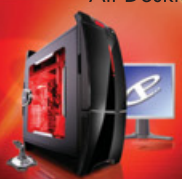

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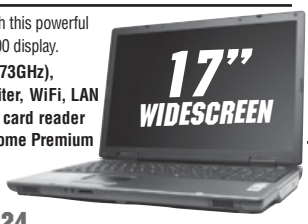

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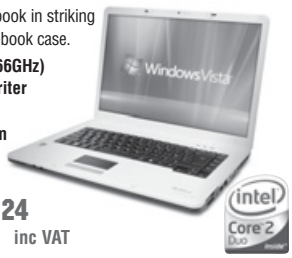

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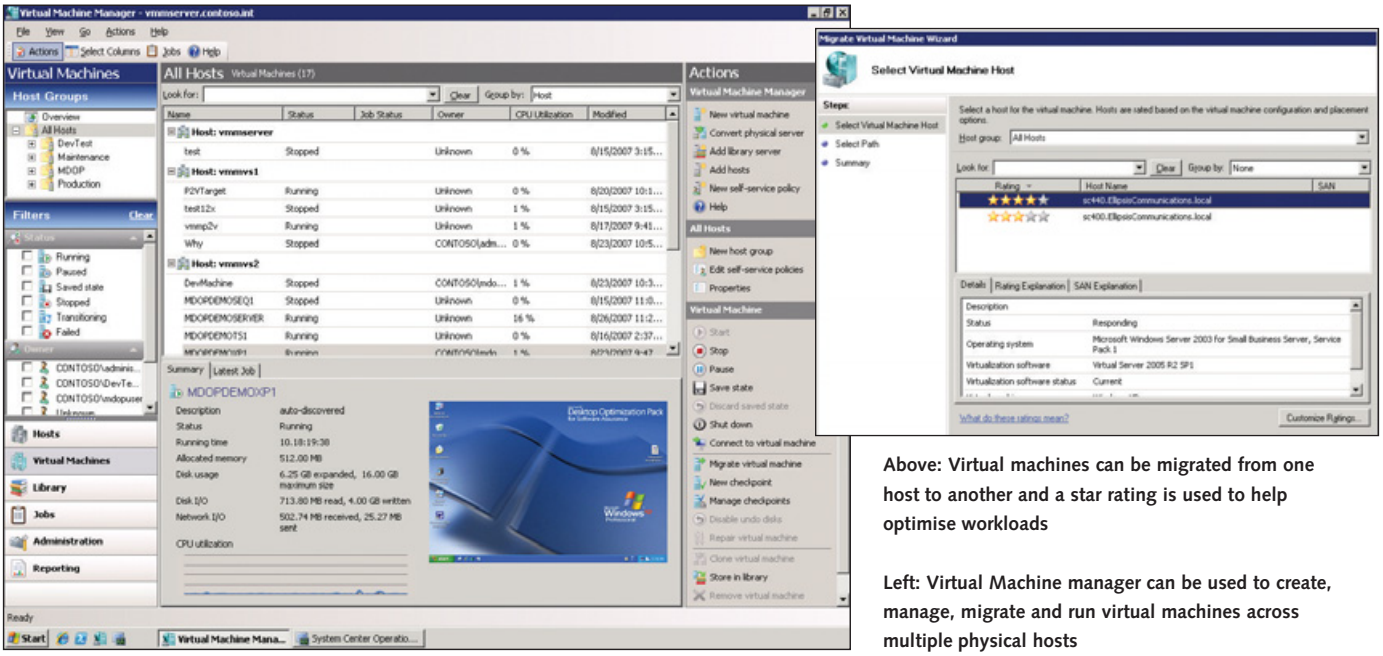
VIRTUALISATION MANAGEMENT

Microsoft Virtual Machine Manager

Manage virtual server sprawl with this centralised monitoring and management tool



Above: Virtual machines can be migrated from one host to another and a star rating is used to help optimise workloads

Left: Virtual Machine manager can be used to create, manage, migrate and run virtual machines across multiple physical hosts

Microsoft's Virtual Server 2005 (see group test on page 103) comes with tools to create and manage virtual machines, but only on the same physical host. For those with more to contend with, Virtual Machine Manager (VMM) 2007, offers centralised monitoring and management across multiple servers. It even allows virtual machines to be moved from one host to another, with tools to recommend intelligently the best deployment. Delegated management is another key feature together with a self-service web portal to allow users to provision VMs themselves.

A member of the Microsoft System Center family VMM 2007 requires a system running Windows Server 2003 or later to host the core VMM server process. An SQL Server database is also required along with a network share, referred to as a library, to manage the VM settings centrally, virtual hard disks, ISO images and other building blocks used to create virtual machines. A VMM agent is also required on each Virtual Server, with everything administered from a central management console.

Server installation is a fairly lengthy process with a number of prerequisites to be met, including the .Net Framework 2.0 plus access to a database host. On a large network a dedicated SQL Server system can be used, although for smaller companies the free SQL Server 2005 Express is also included and was more than adequate for the VMM Workgroup Edition we tested. This has no limits in terms of virtual machines but is licensed for just five physical hosts.

The management console can be run remotely and has the same look and feel as other System Center tools, with a clear set of views to choose from and a context-sensitive action panel. Like other System Center products it's also built on Powershell, which means that anything you can do through the GUI can also be scripted, although that does make the Powershell software a pre-installation requirement.

We found the interface easy to pick up and were quickly able to add existing Virtual Server 2005 hosts and start managing VMs defined on them. Active VMs get their own status display, with links to the standalone remote console plus the tools to start and stop VMs, create checkpoints, save states and so on.

New virtual machines can be created from scratch, with an optional web-based portal available to enable users to create their own from customisable templates. An integrated physical-to-virtual (P2V) tool also makes it easy to migrate existing servers to the virtual world.

Virtual-to-virtual (V2V) migration is another useful option, as is the ability to move VMs around for maintenance and load balancing. VMM will also make sure the host server is properly equipped to handle the workloads involved, with a customisable star rating to help decide which to use. For now it's not possible to migrate virtual machines while they're running, as with the Xenserver and VMWare ESX platforms.

Neither can the VMM software be used to manage anything other than Virtual Server 2005 at present. That, though, is unlikely to be an issue for most small companies, and support for Hyper-V will be added when that product finally ships, followed by the ability to manage Xenserver and, ultimately, even VMWare virtual machines. At which point, Virtual Machine Manager 2007 is likely to become a must-have for any business looking to keep on top of so-called virtual server sprawl. *Alan Stevens*

Verdict

Pros Central VM management across multiple hosts; integrated P2V and V2V conversion tools; VM migration; resource tuning

Cons Long list of prerequisites; no live migration; Windows Virtual Server 2005 hosts only at present

Overall A must-have tool for anyone looking to manage Virtual Server 2005 on more than one system

Features	★★★☆☆
Performance	★★★★☆
Value for money	★★★☆☆
Overall	★★★☆☆

Price from £256 ex Vat for the Workgroup Edition (licensed for up to five physical hosts)

Contact Microsoft 0870 601 0100 www.microsoft.com

System requirements Windows server with minimum 2.8GHz processor, 2GB Ram and 7GB disk space • Windows Server 2003 SP1 or above (32-or 64-bit) • .Net Framework 2.0 • Windows Remote Management (WinRM) • Windows Powershell • SQL Server (SQL Server Express Edition bundled with application)

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NETWORK VIDEO CAMERA

Linksys PVC2300

Keep an eye on your business with this affordable internet video camera

The Linksys Business Internet Camera with Audio is PoE enabled and comes with a mounting stand plus bundled monitoring and recording software

The Linksys PVC2300 is a very robust network video camera, designed specifically for businesses looking to build or extend their own surveillance system. It's not weatherproof, but small enough to be mounted inside a protective enclosure, with a tilt and swivel stand provided to fix it to a wall, ceiling or other flat surface.

The removable lens is located at the front, and is a manual, fixed focus affair which could be an issue when first installed. However, other CS-mount lenses can be attached instead to, for example, add optional zoom or wide angle display facilities plus there's a built-in 4x digital zoom option. Similarly, although the camera lacks its own pan or tilt facilities, it can be used with motorised bases communicating via an RS-485 interface and Pelco 'D' commands, a common protocol used by accessories of this type.

A 10/100Mbits/sec Ethernet port is to be found at the rear with, on the WVC2300 wireless version (around £198 ex Vat), a couple of antennae for a built-in 802.11g Wifi interface. The fixed network port is also 802.3af Power over Ethernet (PoE) compliant, enabling power to be delivered over the Lan connection, although you'll need a compatible PoE switch or power injector to take advantage of this option. Alternatively, a small AC adapter is also supplied.

Also at the rear is a GPIO connector, adding two input and two output ports to enable the camera to be connected to an alarm system, motion detectors and so on. A microphone is built in too, plus sockets for an external microphone and speakers if two-way communication is required.

It took just a few minutes to install the camera on our test network, using a Homeplug Ethernet adapter for ease of deployment. A custom utility can then be used to locate and set up the device, although we simply pointed a browser at the built-in web server and configured it that way.

The output from the camera can also be viewed via a browser with a separate Windows-based monitoring and recording application supplied that can be used with up to 16 cameras altogether. This application lets you record to hard disk or a network share and make use of the motion detection facilities also built into the camera, optionally issuing alerts via email or instant messaging when movement is sensed. Scheduled recording is another useful option.

We found this application very easy to use although we couldn't get the export to AVI option to work reliably and if you're expecting movie-quality video you'll be disappointed. That said, what you get is more than adequate for most surveillance applications, the progressive scan CCD sensor giving surprisingly good results regardless of light conditions. Add an IR light source, and it can even be used in total darkness.

The video signal is simultaneously encoded into both MPEG4 and MJPEG formats, MPEG4 giving the best pictures but requiring lots of bandwidth. Additionally, it's possible to stream the video signal direct from the camera using IP multicast, RTSP and other protocols. As such it's possible to view the output using a variety of devices from PCs equipped with Quicktime clients to video enabled 3G phones.

Cheaper cameras are to be had but, typically, don't offer the kind of features to be found on the Linksys PVC2300, which compares well with similar products from other, more specialist, vendors. *Alan Stevens*

Verdict

Pros Robust; replaceable CS-mount lens; PoE support; bundled multi-camera monitoring and recording software; built-in video streaming
Cons Manual fixed focus; no built-in pan/tilt facility; not weatherproof
Overall An affordable yet robust network video camera that can be used to build or extend a small business surveillance system

Features	★★☆☆☆
Performance	★★★☆☆
Value for money	★★★☆☆
Overall	★★★☆☆

Price £209.99 (£179 ex Vat)
Contact Linksys 0800 068 0327 www.linksys.com
Specifications CS-mount fixed focus lens (500mm to infinity) • progressive CCD sensor • 10/100Mbits/sec Ethernet port • 802.3af PoE support • GPIO connect, integrated microphone • external audio in/out jacks • 160x120, 320x240, 640x480 video resolution • 1-30 frames/sec • simultaneous MPEG4/MJPEG encoding • RTP, RTSP streaming, 3GPP support; bundled monitoring/recording software

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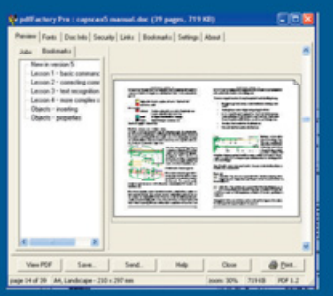

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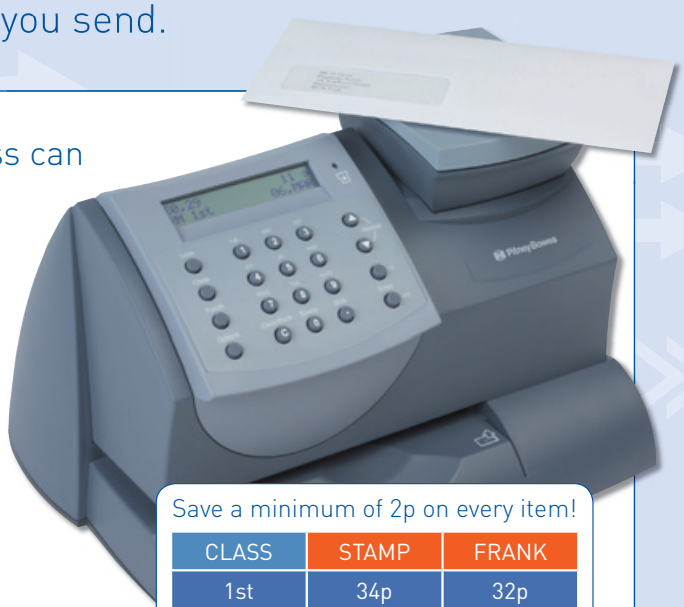

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HANDS ON

DATA TRANSFERS

It's not just on the web that you might want to take data from one source and do something different with it, as we find out in Hands On this month.

In Databases, we explain how you can link mapping information with your existing data, in Spreadsheets we explain Excel's options for importing, exporting and embedding data and in Visual Programming we see how an old application without source code can be given a new lease of life on a different platform.

Windows Vista puts in an appearance too, with a look at laptop performance issues in Hardware and Service Pack 1 for Networks, while updates and new software pop up in Windows and Word Processing, which continues to explore Office 2007's new features.

Keen photographers can find out about backing up in Digital Imaging; we've a look at how Javascript works with cookies in Web Development, a new format for video in Performance, and a history of the Linux KDE Desktop.

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DIGITAL IMAGING

Q I purchased a photo frame a few months back that supports 4:3 or 16:9 formats (resolution 480x234). Viewing normal photos in widescreen stretches the picture and makes people appear fat, but it annoys me having to use 4:3 because I'm not using the full display capability.

I thought that if I could crop the photos to suit that would solve the problem and, to that end, I found picture resizer software on the internet – with a free version that supports batch jobs. Despite this, people still appear fat in the pictures. What am I doing wrong?

Paul Field

If you don't size your photos carefully, people could look out of proportion on a digital photo frame

A You need to make sure of two things. First crop or resize your photos so they are the same pixel dimensions as the frame, eg 480x234. Second, make sure the display is set to this 'widescreen' format. One thing that appears odd is that the pixel dimensions you give aren't 16:9 (234/9x16=416) but closer to 2:1. This could explain why your photos are still being stretched.

Q I've scanned 5,000 photos to JPEG but when they are burned to CD and viewed though a DVD player to TV the first axis to hit the edges of the screen loses a border (about three per cent at each edge if horizontal and two per cent at top and bottom if vertical). If burned to DVD the loss is greater: six per cent left and right or five per cent top and bottom. To make the whole of the original visible requires the addition of the appropriate border in the appropriate axis, which is rather tedious for 5,000 photos. Is there an easier solution than manual resizing?

Keith Blenkinsopp

A It sounds like the DVD player is displaying the photos in the 'overscan' area of the TV display. You might be able to remedy this using the TV display options. Adding a border isn't necessarily tedious if done in a photo editor such as Paint Shop Pro Photo X2 with a batch-controlled script. Alternatively you could create a DVD slideshow in either Windows Movie Maker, or any photo editor. This will display the photos in DVD video format within a 'safe area' avoiding the screen edges.

'Adding photo borders isn't tedious if done in a photo editor with a batch-controlled script'

HARDWARE

Q I bought an external enclosure for a serial ATA hard drive, and in addition to the USB port, it also has an eSata connector, for use with motherboards or cards with eSata ports. Is it safe to plug the eSata connection from the enclosure into the computer while it's switched on? I know I can do this with the USB connection, but the eSata is faster when backing up, and would seem preferable.

Brian J Edwards

A The connection and disconnection of a device while it and the computer are switched on is known as hotplugging, and it's widely touted as a core feature of the serial ATA (Sata) standard. The external version of Sata, known as eSata, makes this more convenient for drive enclosures and computers which feature the connector, but don't just assume it will work.

First of all, you'll need a serial ATA controller that supports hotpluggability, and second you'll also need to enable AHCI mode – which itself needs to be done before installing Windows. You'll know when it's all working because your Sata drive should be presented in Windows as a 'stoppable' device in the Safely Remove Hardware list and you should stop it before removal.

So while hotplugging can be possible, we'd recommend contacting the supplier of your serial ATA chipset to see if it is supported and what conditions are required for it to work. Hotplugging hard disks in an unsupported system could, at best, result in lost data and, at worst, some fried hardware. You can do it, but at your own risk.

Q Sometimes when I load the itv.com website the included video player loads and works perfectly, but at other times I just get a blank black panel in its place. I have tried most of the tricks, including clearing out my browser cache. Any ideas?

Ian McDonald

A Judging by the ITV Player forums (**http://forums.itv.com**) you're not alone (see screen 1). According to the posters there and the official ITV Help page (**www.itv.com/Help/itvplayervideohelp/**), there are several things you can try. If clearing your browser cache doesn't do the trick, disable any ad blockers you might be running; if you're also using any internet security software, such as

Norton, you may want to try temporarily disabling this. While disabling any ad-blocking utilities should do the trick, note that like most online TV players, you'll also need to be based in the UK for it to work.

Q What are the options for transferring 2GB of data from a Windows 98 PC to a Vista PC that is on another site? The Windows 98 PC does not have a CD-RW. I have tried to find a Flash drive but none appear to work with both Windows 98 and Vista capability.
Harold Biggs

A If there's no means to physically connect the two systems, and your USB ports work under Windows 98, then our first choice would be to go for a USB memory key. If possible, try to borrow a key of any size first to see if both systems can recognise it. You may need to format it on the Windows 98 system first.

A second choice would be either to fit a cheap CD-RW drive to the Windows 98 system or temporarily connect one from another PC, then burn a number of discs. If you have a spare hard disk, you could also connect it internally to both systems to swap data. Or you could even remove the main hard disk from the Windows 98 system and temporarily connect it to the newer Vista PC.

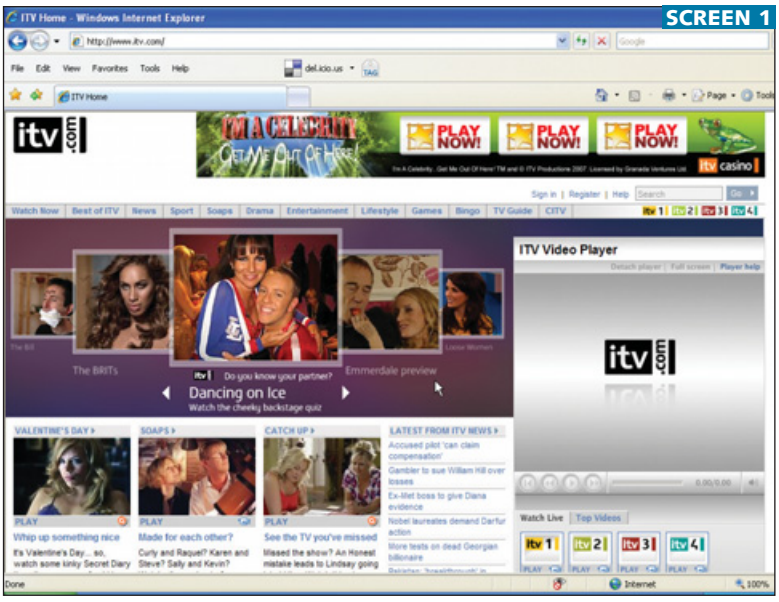
LINUX

Q I would like to get Linux running on the elder of my two PCs. It has an AMD Athlon 1GHz CPU and 256MB Ram. I created a live CD of Ubuntu 7.04 and I can run Linux on my newer PC from the CD. However, when I try it in my older PC the loading starts but it fails after a short time with errors. Is there a way around this problem?
John Routledge

A First, run the latest version – 7.04 has long been superseded by 7.10. Also, the live CD requires at least 320MB of Ram to work with. In order to install it on a 256MB PC, you will need to use the 'alternate' text-based installation method that does not provide a live system running from CD. This is available from the website. Another option is to look at Xubuntu, as this will perform better on your old PC than the standard version of Ubuntu, and the live CD will also work with 256MB of Ram.

Q When I try to install the development tools on Ubuntu 7.10 (the build-essentials package), it always insists I insert the CD. I have installed the operating system for a few friends and it gets annoying. Is there a way to stop this so it can download the packages from the internet?
Ben Eustace

A Ubuntu keeps an index of all the packages available in every repository and includes the installation CD as one of these repositories. It chooses that in preference to the downloadable packages, if the latest versions are the same. To prevent this from happening, you must disable the CD repository. One way is to edit the file/etc/apt/sources.list and comment out the line for the CD; a more user-friendly way is to select 'Software Sources' from the Administration menu, and untick the installation CD option from the 'Installable from CD-ROM/DVD'



SCREEN 1

Some users have found the itv.com video player a little temperamental

The list of More Controls disappears

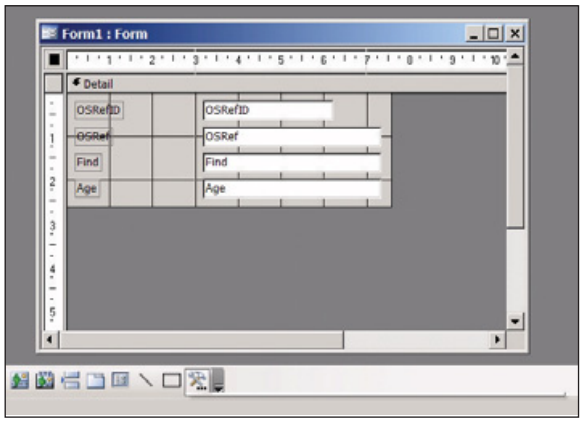
DATABASES

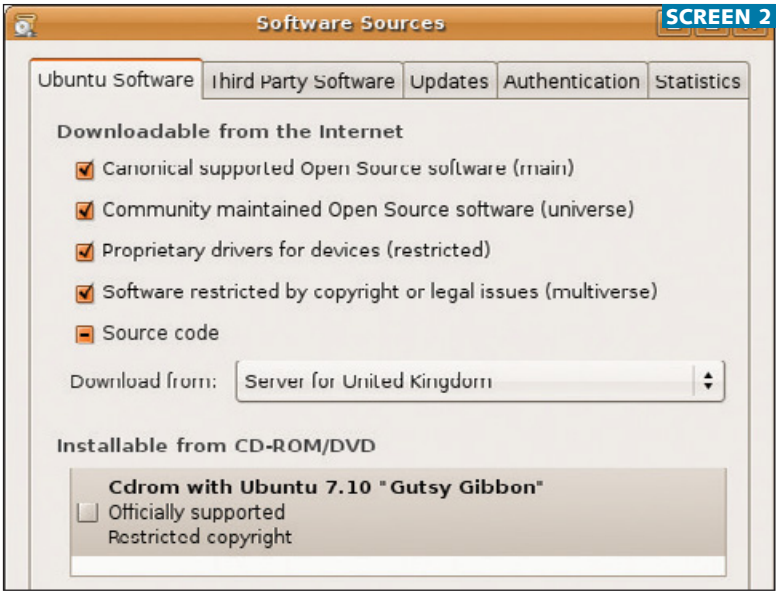
Q I'm trying to see the list of More Controls that Access' toolbox ought to show when I'm designing a form. I click the arrow button but nothing appears, just a sort of white emptiness alongside the button. I've tried switching wizards on and off but it doesn't help. Can you?
Hugo Thoroughgood

A A curious one. You can obviously see some change on your screen, but no actual list. I wonder whether you have anchored the toolbox to the bottom of the Access window so that it appears as a horizontal menu bar. If so, when you click to open the list, if you are using Access full screen, then the list will open downwards and be almost completely invisible except for a flicker showing a thin sliver of the top of the list box (a very unhelpful implementation, I might add).

The answer is to drag the toolbox either to be a free-floating object, or to anchor it to one side. That way it should display the full list properly.

The thin white line of the invisible toolbox





Deselect the Ubuntu CD in the repository list, and you won't be asked for it when adding software

section (see screen 2). After this, the index will be updated automatically.

SPREADSHEETS

Q We want to discourage people from using paper in our office. Is it possible to enable an Excel workbook to be saved to disc but not printed out?
Debra King

A Yes, a short macro can do this. Open the VBA Editor using Alt and F11. If the Projects window isn't displayed press Ctrl and R. In that window, right-click on This Workbook and choose View Code. In the code window (see screen 3) enter:

```
Private Sub
Workbook_BeforePrint(Cancel As↙
Boolean)
Cancel = True
MsgBox "Save paper. Don't↙
print this file", vbInformation
End Sub
```

(Key: ↙ code string continues)

Return to Excel using Alt and F11. Whether you click the Print button, choose Print on the File menu, or use the shortcut Ctrl and P, you will only see your choice of message and will be unable to print the file. The purpose of the message is to make clear that the print prevention is intentional.

Q I can show a number squared in Excel by highlighting the 2 on the end of the number in the Formula Bar and choosing Cells, Font, Superscript on the Format menu. It displays correctly in the cell temporarily, but when I press Enter the Superscript disappears and reverts to a normal number. How do I show a Superscript number?
John Becker

A It depends. If you want to print out, say, 232 you must precede the number with an apostrophe to indicate to Excel that it is text. To refer to the cell in calculations elsewhere, then enter

```
=23^2
```

The circumflex (^) is above the 6 on the top row of a standard keyboard. Excel will display 529 in the cell.

Q Can I have Excel hide the contents of a row based on an entry in a cell? It would be helpful if I could hide a row of a worksheet if the date entered in a cell is before 1/1/2008.
Simon Jones

A You can do this with a VBA for Excel macro within the particular worksheet. Let's say the date is in cell A1 and the row to be hidden is row 10.

Right-click on the tab of the worksheet and choose, View Code. In the code window enter:

```
Private Sub Worksheet_↙
SelectionChange↙
(ByVal Target As Range)
    If Range("A1").Value ↙
<#1/1/2008# Then
Rows("10").EntireRow.Hidden = ↙
True
    Else
Rows("10").EntireRow.Hidden = ↙
False
    End If
End Sub
```

Save the file (see Screen 4). This macro is run by the Event of clicking anywhere on the worksheet. Dates are indicated in VBA by number signs (#). EntireRow is a Property of the Range object. Enter in cell A1 a date prior to any in 2008. Nothing happens. Enter any date in 2008 and row 10 will be shown. To hide row 10 again, enter a date prior to 1 January 2008.

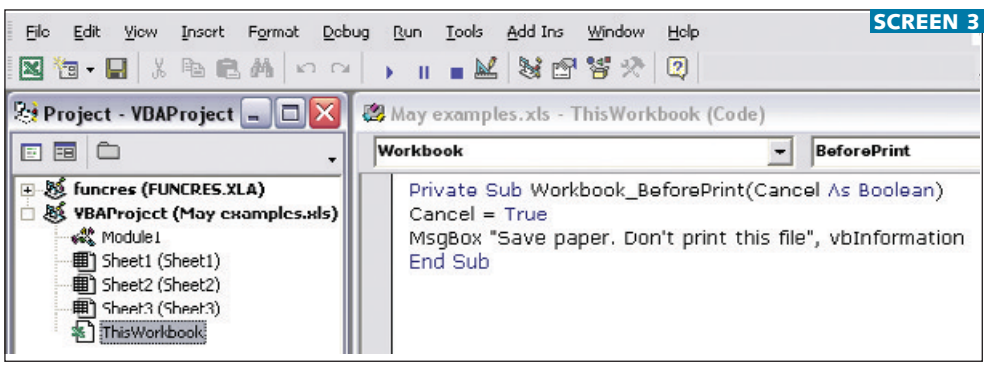
Q In the first column of an Excel worksheet I have a list of letters: A,B,C and so on. In the next column I have values. I cannot sort this table as I have to leave the letters in random order. At the bottom I have a summary of A,B,C etc. Is there an easy way to sum all the numbers associated with each letter? That is, a total of the A values, B values, and so on.
B Sturgess

A First create two Names. Hold down Shift and click on the first and last letter in column A. This will highlight the range of cells containing letters. In the Name box, which is on the left-hand side of the Formula Bar, enter the Name 'Letters'. Similarly, highlight all the values in column B and Name that range of cells 'Numbers'. In a cell at the bottom of column A enter 'Total of As'. In the adjacent cell in column B enter

```
=SUMIF(Letters,"A",Numbers)
```

This assumes you are using a recent version of Excel. In older versions, which don't offer the SUMIF function,

You can stop users from printing an Excel file



SCREEN 4

```
May examples.xls - Sheet1 (Code)
Worksheet                    SelectionChange
Private Sub Worksheet_SelectionChange(ByVal Target As Range)
    If Range("A1").Value < #1/1/2000# Then
        Rows("10").EntireRow.Hidden = True
    Else
        Rows("10").EntireRow.Hidden = False
    End If
End Sub
```

Excel can hide a row based on a cell entry

you can total the A values using **=SUM(IF(Letters="A",Numbers,""))** Instead of pressing Enter, press Ctrl, Shift and Enter. Excel will add curly brackets to acknowledge that this is an array formula. To total the B values use **=SUMIF(Letters,"B",Numbers)** or the array formula **=SUM(IF(Letters="B",Numbers,""))**

WINDOWS

Q I used to have Windows 98 on a second hard drive as a backup emergency system. Just as I was backing up the whole partition, the disc gave up the ghost. I am now trying to rebuild Win98 on a new disc but I can't recall the name of one add-on I need. Its function was to add a second pane to Explorer displaying the folders, making it like Windows 2000. Can you help me to identify this utility?
Peter Willcox

A It's not a separate utility, it's there in Windows. Click on the View menu, choose 'Explorer Bar' then tick 'Folders' in the submenu (see screen 5).

Q I have a problem with Windows Vista Home Premium: the Sidebar has vanished. I have tried the usual way to bring it up and all that appears is a shadow where the bar should be. I would like to get it back, but I have tried everything.
Peter Blake

A If you are seeing a shadow, then the Sidebar is open but you may not have any gadgets installed in it. Right-click in the shadow, and choose 'Add gadgets'. In the window that appears, double-click on a gadget to add it to the Sidebar.

WORD PROCESSING

Q I find that if I centre text in a column in an MS Word 2003 table or set tabs to align a column of numbers in a table, the alignment of text above and below the table is altered. If I then place another table below and set the alignment in cells in a column, my carefully crafted settings in the table above are lost. It seems I am not alone in this. How can I prevent it?
Pat Soutter

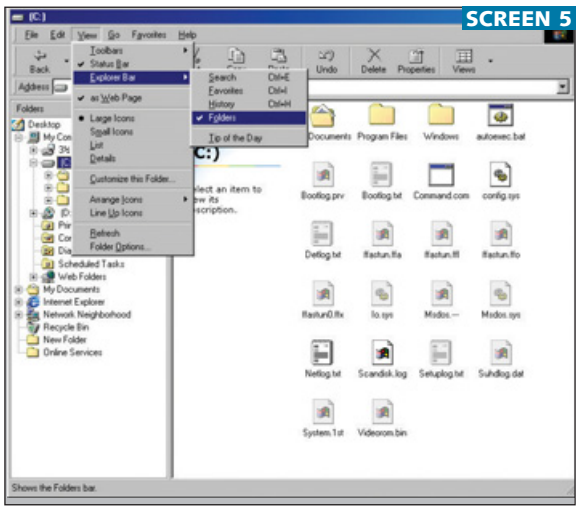
A This sounds as if one or more styles used in the table are set to 'automatically update', so that any changes made to the formatting of one instance of that style is carried through to all instances of it. If you place the insertion point in an instance of the Style then open the Style Pane, you'll see that style selected – right-click and Modify, then clear the 'Automatically update' checkbox.

Q I am having a problem with Microsoft Office 2003. Whenever I try to open a Word file and a Publisher file that was written before I upgraded, I get the message – 'Cannot open a file created in an earlier version of Microsoft Office This file type is blocked from opening in this version by your registry policy settings!'
Peter Benda

A This is indeed a security setting. In Office 2007, the problem can be solved by making the containing folder a 'Trusted Location'. In Office 2003, the problem only occurs when you install Service Pack 3. Microsoft has provided a fix for this, in the form of a downloadable Registry merge file, which you'll find at **http://support.microsoft.com/kb/938810**, and you'll find further information in this month's Hands On Word Processing column.

See the folder tree in Windows 98

SCREEN 5



Q I know that it's possible to change the text direction in a text box to run vertically instead of horizontally, but is it possible to rotate it, so I can have text running at 30 degrees to the horizontal? I'm using Word 2003.
Sal Brewster

A You can't rotate a text box or its contents freely, but there are a couple of workarounds which should do the trick. One is to copy a text box, then Edit, Paste Special, as Picture (Windows Metafile). You should then get a green rotation handle above the resulting picture.

If you don't get this, right-click on it, Format Picture, and check that the layout is not set to 'In line with text'. The other method is to use Wordart. Choose the first style in the gallery, type your text and pick a font.

To get rid of the hollow effect, set the fill colour to black and the line colour to 'No line' from the Drawing Toolbar. Adjust the sizing handles of the result to get the text proportional, then use the green rotate handle to angle it.

Neither method is perfect – the appearance of the text changes somewhat when rotated, but our experiments found the printed result was better than on the screen. **PCW**

LET US HELP YOU

All our experts welcome your queries. Please respond to the appropriate address below

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Hardware hardware@pcw.co.uk
Linux linux@pcw.co.uk
Networks networks@pcw.co.uk
Performance performance@pcw.co.uk
Sound sound@pcw.co.uk
Spreadsheets spreadsheets@pcw.co.uk
Visual programming visual@pcw.co.uk
Web development webdev@pcw.co.uk
Windows win@pcw.co.uk
Word processing wp@pcw.co.uk

Gordon Laing has been a hardware enthusiast since his first Sinclair ZX80 and as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing.

→ Comments welcome on the Hardware column.
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Boosting mobile performance

With a few tweaks, you can hugely increase Vista's performance on your laptop

Superfetch and Readyboost are the Jekyll and Hyde of Vista's features; on the positive side, they can accelerate application performance, but both have an evil side that forces you to endure heavy disk activity as your system starts up, during which time it's effectively rendered unusable.

This is frustrating enough on a desktop system as you start the day, but it can drive you to distraction if you want to squeeze in a bit of work on a laptop while you're, say, waiting for a train or a colleague to arrive.

In this month's Hardware column we'll look at the various things you can do to improve the speed and handling of a Vista laptop – and the common culprits may not be as guilty as you'd think.

The test system

Our test subject was a Sony Vaio TZ150N: an ultraportable laptop sporting an Intel U7500 1.06GHz Core2Duo processor, 1GB of Ram and a 100GB hard disk with Windows Vista Business pre-installed. The Vaio TZ150N is a smart-looking laptop and a great form factor for portability, but its default configuration results in lousy performance.

Sony's Vaio TZ150N ultraportable laptop looks great, but the default configuration results in lousy performance. But that doesn't mean Vista can't run smoothly on a 1.06GHz laptop with 1GB of Ram

Much of the criticism has been down to Vista, with Sony now offering a full set of Windows XP drivers online for anyone wishing to 'downgrade'. But that's almost too easy. Before pulling the plug on Vista, we wanted to see how much it could be improved.

Out-of-box experience

Upon first switching on the Vaio TZ150N, you might wonder what all the fuss is about. Vista's login screen pops up just over a minute after a cold power-up, which isn't that bad. But it's what happens after you log in which can have you wondering if a PDA and keyboard might have been a better idea for banging out notes or emails.

We used Vista's Resource Monitor (see screen 1) to measure disk activity – you can fire this up from the standard Task Manager. Disk activity rarely stops altogether on a modern PC or laptop, but we'd say if it hovers below five per cent for any length of time, it's pretty much poised for action.

So to measure the impact of the following tweaks, we timed how long it took from login to the point at which disk activity fell and consistently stayed below five per cent. We also timed how long it took to launch Photoshop CS3 once, followed by a second time (giving Vista a chance to cache it), and finally the time taken to shut down completely.

Out of the box, our Vaio TZ150N hammered its disk for just over five minutes after logging in, during which time it was effectively unusable; it even took over three minutes before the gadgets appeared on the desktop.

Launching Photoshop CS3 for the first time took 25 seconds, but closing and relaunching saw it cached and ready for action in just six seconds. Shutting down took just under a minute and a half.

Readyboost to the rescue?

Vista's Readyboost technology claims to offer performance benefits (see box left), so we fitted a 1GB Corsair USB memory key and allowed Vista to use the recommended amount. With the system restarted, the gadgets arrived slightly slower at just under four minutes, but Vista kept us waiting 11 minutes before the disk activity consistently stayed below five per cent. This longer time was down to Vista populating the key's cache.

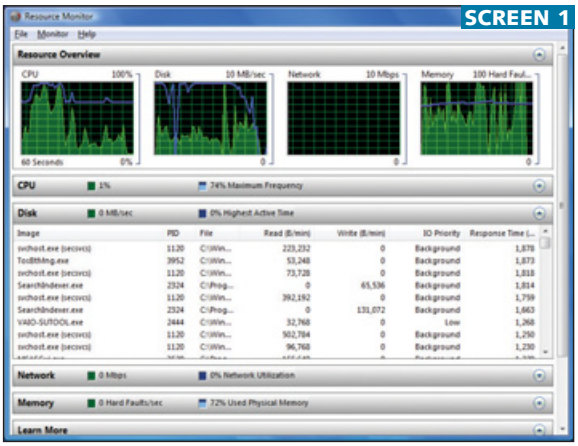
Sadly the 1GB of Readyboost did little to improve our application

What is Readyboost?

Readyboost is a Vista technology that is supposed to improve application performance, but at the cost of significant disk activity as your machine starts up.

As explained in September 2007's issue, Readyboost creates an intermediate cache between your hard disk and Ram using Flash memory, such as a USB memory key. At first this seems odd, since hard disks deliver considerably quicker sequential data access, but decent Flash memory can actually outperform hard disks when it comes to small random-access transfers.

As shown in September and October's editions last year, Readyboost is most effective on systems with modest amounts of Ram – indeed on systems with 2GB of Ram or more, we found it can actually slow some tasks. Readyboost can deliver performance benefits on certain systems with less than 1GB, but we'd recommend doing your own tests to see if it's really helping.



launch times, with Photoshop taking 27 and six seconds to launch the first and second times respectively. Shutdown was a little quicker at one minute and eight seconds.

We then tried a 2GB Crucial USB key, again allowing Vista to use the majority as recommended. This time the Gadgets arrived in two minutes and seven seconds, but overall we were looking at a longer wait of 13 minutes and 25 seconds before the disk activity slowed. That's a quarter of an hour after first powering up the laptop, and frankly unacceptable. The application and shutdown times were again virtually unchanged.

Following our earlier desktop tests with Readyboost, we'd really not recommend this technology unless you're running Vista on systems with 512MB of Ram – or less. And to be honest, with that amount of Ram, you shouldn't bother with Vista at all.

The Disk section of Vista's Resource Manager reveals the degree of activity. Here you can see the graph fall from an extended period of 100 per cent usage as Vista started up, to a more responsive level below 10 per cent

Superfetch, be gone

Superfetch is another Vista technology that claims application performance benefits, but again at the cost of prolonged startup times – see box for details on how it works. By default, Superfetch is enabled in Vista, so it had been running during all our laptop tests so far.

To adjust Superfetch, open Vista's Administrative Tools Control Panel, enter Services, then scroll down the list until you find Superfetch and double-click it. You'll now be offered the option to disable the feature.

With Superfetch disabled (and no USB keys fitted) we were disappointed to find the time to lower disk activity hardly improved at all from the out-of-box configuration – we were still looking at just over five minutes, but now suffering from slower application performance, with Photoshop taking almost twice as long to launch (46 and 14 seconds for first and second launches respectively).

We've found disabling Superfetch on some desktop configurations can seriously improve startup times, but it had no such benefit on our laptop configuration, proving you should never make assumptions and always test. But was this the best startup time we could hope for on the Vaio?

Startup items

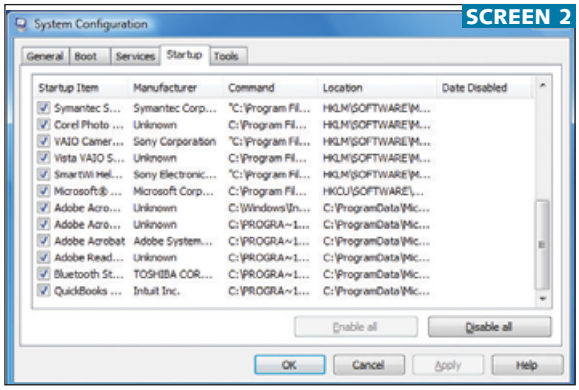
Adjusting or disabling Superfetch and Readyboost can impact startup times, but if your system is taking longer than you'd like, we'd advise taking a look at the actual items loaded during startup.

Type System Configuration in the field marked 'Start Search' on Vista's Start Menu, click the Startup tab and prepare yourself for a shock. Our brand new Vaio had no fewer than 26 items loading during startup (see screen 2), many of which were free trials and pointless Sony utilities. As always, disabling startup items takes some trial and error, but we quickly whittled the list down to eight items without compromising functionality.

The laptop disk activity now calmed in just one minute and 32 seconds – over three times faster than the standard configuration. Since Superfetch was still enabled, application performance was as good as we'd measured so far, and shutting down was quicker too at 56 seconds.

If you're really keen on seeing what's going on as you startup, check out the excellent free Autoruns utility from **http://technet.microsoft.com/en-gb/sysinternals**. This allows you to adjust a huge array of startup activity without any nannying popups.

Vista's System Configuration lists all the main items loaded during startup. Our laptop, fresh out of the box, had no fewer than 26 items listed here, significantly delaying startup



Conclusion

There's lots you can do to significantly improve the startup speed of a laptop without compromising its functionality – and crucially while Readyboost and Superfetch can slow a system power-up, a simple spring clean of the startup items made the biggest difference on our test system.

All systems can become clogged over time, but the big surprise is how many unnecessary items can already be present on a brand-new laptop. Our Vaio was effectively performing like an ageing system, delivering a very disappointing experience. The moral here is don't assume a new system is anywhere near as clean as one that you've installed yourself.

So if you have a pre-built system that's not performing as well as you'd like, check out its startup items, as well as experimenting with Superfetch and Readyboost. You may find significant gains are possible without upgrading the hardware or resorting to a different OS. That said, both are exactly what we'll be doing to our Vaio in a future edition of Hardware, so stay tuned. As always, we'd love to hear from anyone who's tweaked their laptop for the better – or worse. **PCW**

What is Superfetch?

As explained in more detail in the November 2007 edition, Superfetch is Vista's intelligent caching technology which preloads Ram with commonly used data, based on previous boots and application launches. The more you use Vista, the more it learns your habits, and the more effective this caching should become.

As you start Vista, Superfetch and the standard Windows caching process begin populating Ram with files, and you can see this process in Task Manager, watching your free physical memory steadily decrease until there may only be a few megabytes remaining. At first this may seem distressing, but the memory's just being used a cache and can be freed up to serve other tasks or applications as required.

Disabling Superfetch on a test desktop system reduced startup times from three minutes and 20 seconds to one minute and 38 seconds. Application startup times typically doubled though.

Gordon Laing has been a hardware enthusiast since his first Sinclair ZX80 and as a former editor of PCW and contributor for over 10 years, what he doesn't know about technology isn't worth knowing.

→ Comments welcome on the Performance column.
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Decoding Matroska's mysteries

Never heard of Matroska? We explain everything about this HD video format

If you like playing high-definition video on your PC, you'll almost certainly have come across the Matroska file format (MKV). Matroska has become the AVI of the HD era, and is commonly used for transporting high-definition content. If you've tried to play an MKV file though, you may have experienced disappointing performance with dropped frames or an inability to hear multi-channel surround sound.

Like all digital formats, Matroska has been used to distribute copyrighted material, but it can equally be used for open, officially licensed or personally owned content. As such, it's an important format and here we're concerned with the requirements for playing it smoothly on your PC.

What is Matroska?

Matroska is actually a container for AV files. So like AVI, you can't encode a file into the Matroska format, then decode it for playback. Instead you would encode a file into something like MPEG2, DivX or H.264, then transport it in Matroska. As a container format, Matroska takes care of navigation of the actual content, along with managing multiple audio and subtitle streams. Matroska is an open format and aims to be extendable and as future-proof as possible, giving it an advantage over many existing container formats. You'll come across Matroska as a container for video and audio, using the file extension MKV, although there's also an audio-only version called MKA.

Playing Matroska

To play Matroska files on a Windows PC, you'll typically need three pieces of software: a media splitter, media decoder and a media player. The media splitter is used to access the video and audio files within the Matroska container. The most popular for Matroska playback is the Haali Media Splitter, a free download from **http://haali.cs.msu.ru/mkv/**.

Windows Media Player Classic's simplicity makes it perfect for playing the Matroska video file format

The media splitter allows access to the separate video and audio files, but knows nothing about how they're encoded, so you'll then need the appropriate decoding software. This depends on what encoding format was used for the video files in question, but most of those commonly contained in Matroska files are covered by the FFDShow, free to download from **http://sourceforge.net/projects/ffdshow**.

You should now be able to enjoy most Matroska files in the media player of your choice, but you may still be disappointed by the result. If you're running the latest Windows Media Player for example, you may still experience choppy playback and stereo sound when you expected smooth video and multi-channel audio.

Rather than automatically looking at upgrading your hardware, the answer could be to use a different media player. One of the most popular for Matroska is a modified version of an older Windows Media Player. The so-called Media Player Classic is freely available and at first glance appears very basic. But it's this simplicity, along with built-in support for modern tasks, which makes it one of the consistently reliable media players around.

We've wasted hours trying to get WMP 10 or 11 to work smoothly or deliver multi-channel audio, only to find Media Player Classic getting it right first time without modification. We've also found it integrates better with third-party utilities like the AC3 Filter, which can be used to ensure multi-channel audio is either passed-through an SPDIF connector unmodified, or encoded in real-time to Dolby Digital – great for playing WMA 5.1 files through an external decoder which wouldn't otherwise understand them.

The latest Media Player Classic is a March 2006 file from **http://sourceforge.net/projects/guliverkli/**. AC3 Filter can be found at **http://ac3filter.net/**. You can also use alternative media players, some of which already have the required codecs built-in. VLC, the Core Media Player and Zoomplayer are popular choices.

The easy route

Recognising that Matroska playback typically involves downloading a splitter, a codec and an appropriate media player, many sources now offer a single pack with the latest versions of each, along with additional utilities and codecs to cover most eventualities. The Combined Community Codec Pack (CCCP) is a popular choice (**www.cccp-project.net**), or the K-Lite codec pack from **www.k-litecodecpack.com**.

While single packs appear to offer the most convenient route, we've found they often install more items than you need, so for a minimalist approach, we'd recommend installing a separate splitter, decoder and player.

Job done

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Source: v271

Tim Nott is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family.

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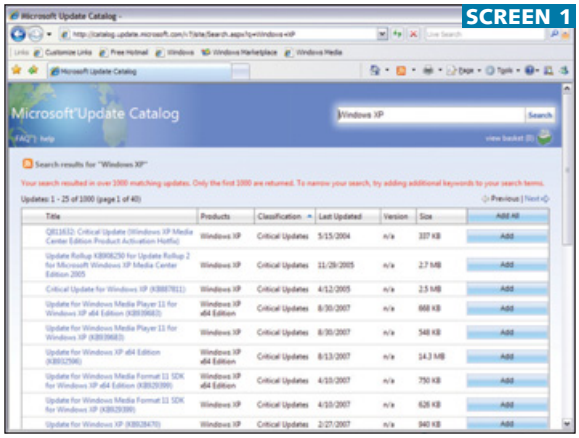
Download Updates

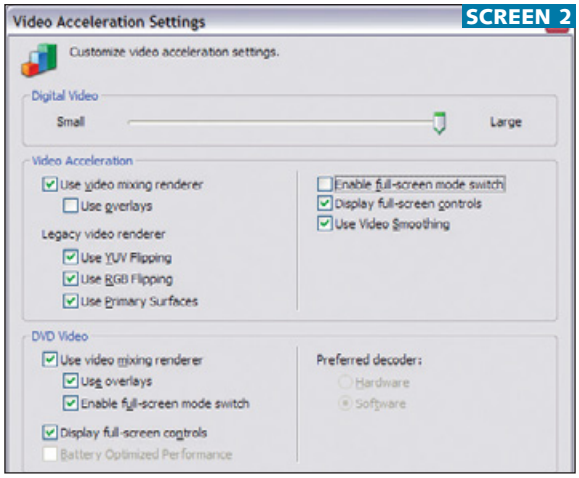
How to save Updates to make securing Windows a painless job

Exactly four years ago, we showed how it was possible to download and save Windows Updates for use on other PCs, or to avoid having to download all the updates again after reinstalling Windows. Reader Larry Tomkins, who evidently keeps all his issues of *PCW*, reminded us of this and wanted to know if it was still possible.

The good news is that it is still possible, although the procedure has changed and is now even more long-winded than before. So this is what you do in XP. Start All Programs, Windows Update. In the list of options on the left, choose 'Use administrator options'. In the page this produces, you'll see a blue link in the first paragraph to the 'Windows Update Catalog'. Click on this and, if you haven't done this before, you'll be presented with a few hoops to jump through. First, you'll get a warning at the top of the screen stating that 'This website wants to install...Microsoft Update Catalog...' Click on this, then choose 'Install Activex control' from the pop-up menu. This will produce a dialogue with an install button. If the latter is greyed out, then click the 'More Options' button and select either 'Always install...' or 'Ask every time...'. Then click the Install button. When the installation completes, a new IE window will appear showing the Microsoft Update Catalog. This is less helpful than it was four years ago as, instead of classified lists, you get a search field. Putting 'Windows XP' in here, for example, returns over 1,000 results (see screen 1). As before, you can download updates for any supported version of Windows.

Having got the search results, you can browse through them, clicking the 'Add' button for each item you want to download. When you've made your selection, click 'View Basket' at the top of the screen, and when the basket contents appear, click 'Download'. Yet another window will open asking you to select a folder to download to. Click the Browse button, select a folder, then Continue. You may be presented with a licence agreement at this stage, after which the files will commence their download. We hope.





Top: An awful lot of updates

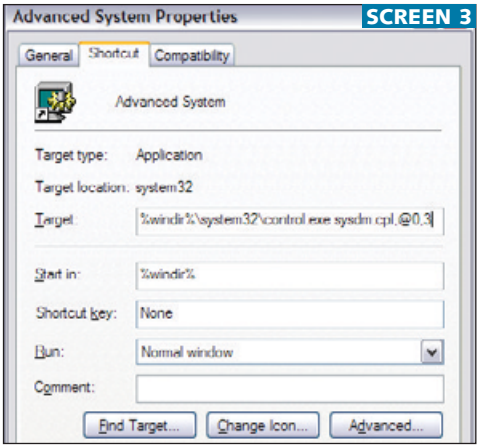
Above: Turn off overlays to grab frames

Screen escapes capture

Now here's a strange thing. Reader Roger Castle-Smith has been corresponding with this column since the days of Windows 95, so he knows his way around it. He was using Windows Media Player to play a .wmv file, and wanted to take a screenshot. So he paused the video, pressed Alt and Print Screen to capture the Media Player window and pasted this into a Word document. All seemed OK until he came to print the document. The captured Media Player window had no content.

You can try this for yourself, pasting screenshots into any application that will display bitmaps, and you will notice other strange effects. The framing may be different in the screenshot and, even more bizarrely, if you make a second capture and paste it, the first capture changes to the second. If you then close Media Player, both captures will lose their contents. So, what's happening?

With video, all the usual rules of display disappear. The contents you see when playing video in Media Player are overlaid, rather than being contained within the WMP window. When you paste a screenshot, the overlay 'punches a hole' in the host application. If you move the latter's window around you'll see different parts of the frame. So, if you want to make screen captures you won't do it this way. There are several workarounds, including third-party software, but the simplest method is to go to Tools, Options, Performance. Click on the 'Advanced' button and this will produce the Video Acceleration Settings dialogue. In the Video Acceleration section, clear the 'Use overlays' box (see screen 2). This will let you make screen captures in the normal way. It will also reduce performance and playback quality, so don't forget to turn it back on after taking your shots. Note that the equivalent setting for DVD video doesn't appear to work, but we were able to grab screens from both .wmv and .avi files.



Precision targeting

In January's column we looked at a way of creating your own folder of Control Panel 'favourites' in the Windows XP Start menu. This month we'll refine that with a trick that lets you jump straight to a specific tab of a Control Panel item. You can't do this by dragging and dropping so first open the Start menu. Navigate to (or create) the 'My Controls' folder and create a new shortcut.

Let's say you want to go straight to the Advanced tab in System Properties. The System Properties component file in XP Control Panel is Sysdm.cpl. It has seven tabs, and the Advanced tab is the third from the left counting the home tab – General – as 0. A shortcut to `control.exe sysdm.cpl,@0,3` will open System Properties with the Advanced tab already selected (see screens 3 and 4).

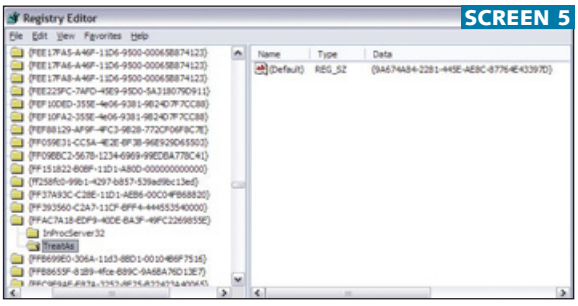
Not all Control Panel items behave in this way – some, such as Network Setup or Add Hardware launch a wizard. Others, such as Administrative Tools or Fonts, open another folder, and others still, such as Add and Remove programs and User Accounts, have a different interface for switching between sections. Of those that do, consistency should not be expected. Whereas System Properties behaves impeccably with @0,0 opening the General tab through to @0,6 opening the Remote tab, other applets don't. The Regional and Language tabs appear to be numbered from @0,1 to @0,3, and Display settings goes from @0,0 opening the Desktop round to @0,5 opening the usual default tab, Themes. Power Options doesn't appear to respond to any switch, and the waters may be further muddied by device drivers and other software that add their own tabs. Table 1 shows some common Control Panel items with their CPL filenames and number of tabs. Feel free to jump in and experiment. Note that your shortcuts will have a default icon – you can improve on this by changing the shortcut icon to one in the corresponding CPL file, or any other icon that takes your fancy.

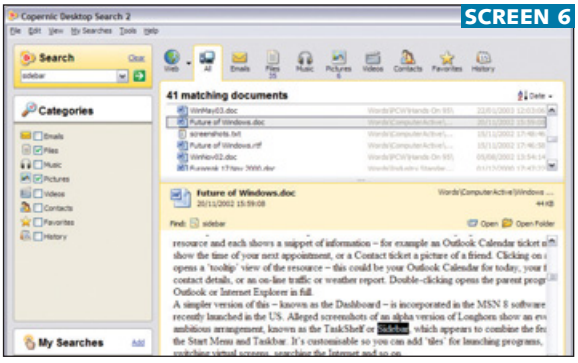
Left: This hand-made shortcut…

Right: …takes you straight here

Below: Bring back the Search Companion

Bottom: Copernic – we like it and it's free for personal use





Cake and eat it

Although Windows Desktop Search is a great improvement on the XP Search Companion for finding files with certain content, it's not the best tool for finding files by name – especially in non-indexed locations. If you're trying to hunt out an executable file or DLL, for example, you are far better off with the Search Companion. One annoyance here is that if you've installed Desktop Search, then the Search commands on the Start Menu, and the Windows Explorer toolbar will now launch Desktop Search instead of Search Companion. To get to the latter you need to scroll down the left pane and 'Click here to use Search companion'. It doesn't seem possible to create separate shortcuts for the two searches. There are, however, some workarounds.

The first involves a Registry edit. Having made a System Restore point, go to `HKEY_CLASSES_ROOT \CLSID \{FFAC7A18-EDF9-40DE-BA3F-49FC2269855E} \TreatAs`. Export this key as a .reg file (this will give you an 'undo' merge file) then delete the TreatAs key (see screen 5). This will restore the old behaviour of the Start menu and Explorer toolbar items, but you'll still have the functionality of the Desktop Search from the Taskbar toolbar. However, there is a sacrifice – you lose the specific Desktop Search Explorer bar.

Windows Desktop Search is not the only option. Copernic compares favourably with WDS. It has a faster preview, searches non-Microsoft mail, and seems less prone to bugs. So, what we've done is to ditch WDS, revert to the Search Companion for searching for files, and use Copernic for searching in files. You'll find it at **www.copernic.com**. **PCW**

Control panel item shortcuts

Filename	Control Panel item	Tabs
Access.cpl	Accessibility options	5
Appwiz.cpl	Add or remove programs	N/A
Desk.cpl	Display	5
Firewall.cpl	Firewall	3
Inetcpl.cpl	Internet options	7
Intl.cpl	Regional and Language	3
Main.cpl	Mouse and Keyboard	5,2
Mmsys.cpl	Sounds and Audio	5
Nusmgr.cpl	User Accounts	N/A
Powercfg.cpl	Power Options	4 – but can't be configured
Sysdm.cpl	System Properties	7
Timedate.cpl	Date and Time	3
Wscui.cpl	Security Centre	N/A

Barry Shilliday has worked with computers for almost two decades. By day, he is a Linux and Unix consultant, but in his free time he prefers to travel the world – and snap it with his camera.

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Experiment with KDE desktop

We look at the history of the KDE desktop, and what's on offer in the latest version

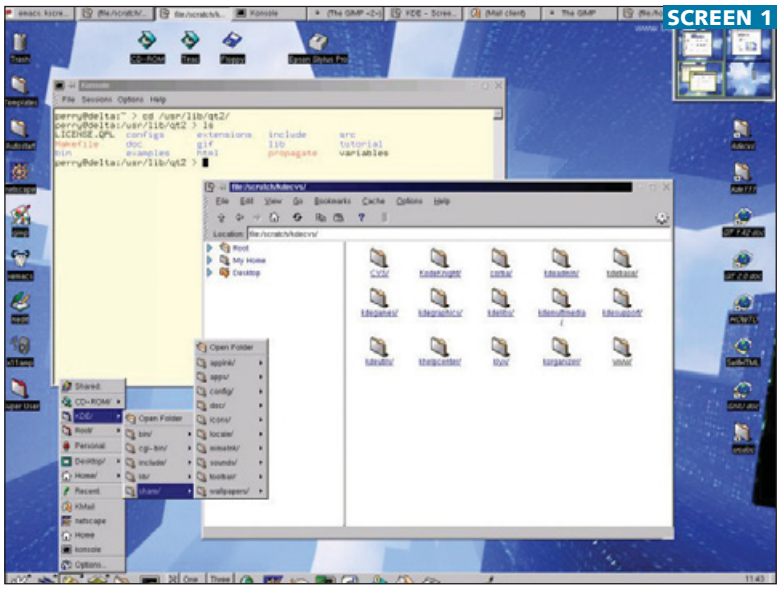
Although the Linux kernel first emerged in 1992, it was 10 years ago, in 1998, that the operating system really began to develop into something more than a project for enthusiasts. This was the year that saw some important developments with Linux and free and open-source software; investments from Intel, IBM and Oracle, the first major corporate investments to be seen; the open release of Mozilla, the code for the Netscape web browser, which ultimately led to the creation of Firefox; and the first stable release of the KDE desktop.

At the time, the Linux desktop comprised little more than a few basic windows on a plain graphical display. Menus could be created (often by hand, with complex text configuration files) to launch programs you would typically otherwise run from a terminal window.

From such a sparse desktop, the early versions of KDE were certainly playing catch up. Comments such as "it is almost as good as Windows 95" were not only common, but considered to be a good thing. KDE did, of course, develop substantially over the subsequent years. Technology introduced in KDE 2 (released in late 2000) was substantially better, including the use of a network-transparent input/output architecture (kio-slaves), the Konqueror web browser, and the KOffice suite. These new features were to be more mature and integrated in the KDE 3 series, initially released in 2002, and still developed and enhanced today.

And so, 10 years on, KDE 3.5 has grown to become a stable, integrated and advanced desktop, offering a number of features not found in any other desktop environment.

This progression of development has now ceased, however, to make way for the new, and fundamentally different, KDE 4.



The original KDE 1.0 desktop, catching up with Windows 95

KDE 4

KDE 4.0.0 was released in January 2008. It was a rather controversial release, however, and not one accompanied by the fanfare you might expect from such a major new version. The developers have tried (somewhat in vain) to emphasise the difference between KDE 4 as a project and KDE 4.0.0, the latter being the first ever official release of the new desktop, and not a stable, production-ready desktop. The developers see KDE 4 being good enough to last the next 10 years, with the new technology improving and developing with each release.

We'll take a look at some of these new underlying features to see some of the things that have changed. KDE 4 also provides a number of frameworks, each given a marketing-friendly term to describe its function.

The biggest underlying change comes from the new version of Trolltech's (**www.trolltech.com**) Qt toolkit. Qt 4 improves upon efficiency as well as design. Together with the improvements in KDE 4's architecture, the memory usage of the desktop is reportedly set to drop by as much as 40 per cent over KDE 3.5, which is quite remarkable in itself. Another change comes from the licensing of the libraries. With earlier releases Qt was available under an open-source licence only on Linux and Unix platforms, which has meant very limited use on Mac OSX and Windows. With this restriction gone, KDE applications can now run on these platforms too and, thanks to the cross-platform nature of KDE 4 and Qt, porting software between platforms is almost trivial.

Solid is the new hardware Application Programming Interface (API). This framework allows KDE applications to get information about the hardware they are running on. Previously the developer would have to understand how the operating system presented this information,

KDE 4.0.0 brings major new changes to the Linux desktop

which will differ completely between Linux, FreeBSD, Mac OSX and Windows. By using Solid, a KDE developer need only know the standard API functions KDE provides, and not know about the operating system the application may run on. A CPU-intensive application could, for example, modify its behaviour if it found it was running on a quad-core CPU. A network utility would be able to discover if there was a network connection available or not.

Phonon is the multimedia equivalent to Solid. KDE developers now can play back video and audio by using this simple API. As with Solid, the developer would previously have to understand the multimedia system, and with so many completely different options around, developing multimedia applications was incredibly difficult. Trolltech has created Quicktime and DirectX backends for Phonon for the Mac OSX and Windows platforms respectively. Not only does this show enormous confidence in KDE's design, but it means that a KDE developer can write multimedia applications for all three platforms with no major code changes.

Plasma is the new desktop shell. Instead of the traditional desktop display and panel applications, Plasma creates a number of containment objects (the desktop and panel being two of these), where applications called Plasmoids may run. These can be resized and rotated, added and removed, and replace the old panel-based and desktop-based applets from earlier releases of KDE. Plasma is one of the main problem areas for KDE 4.0.0, and is expected to improve dramatically by the release of 4.1. Using the other frameworks, such as Solid and Phonon, as well as the enhanced communication protocol of KDE 4, Plasmoids have the potential to provide some powerful functions.

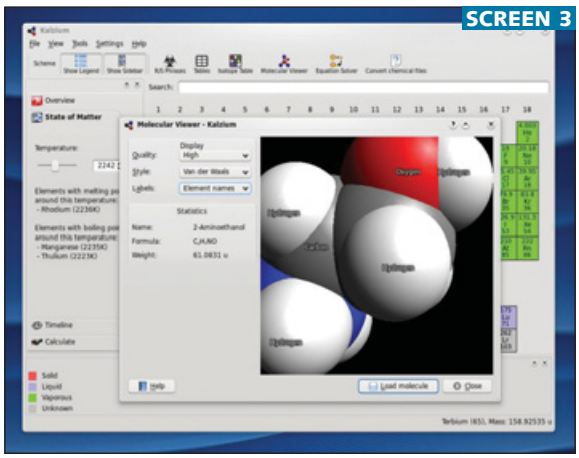
Oxygen is the new visual design. What initially began with a new icon set became a completely new look to the desktop. The icons (and there are many thousands in KDE) have been redesigned using SVG (scalable vector graphics), which allows the icons to be scaled to any size without any loss of quality. The colour palette has been chosen carefully and consistently, giving icons of importance more noticeable colours than those that are not. The widget style has changed completely from KDE 3; a much cleaner, more modern style, available in both light and dark grey colour schemes.

Application changes

In addition to these major underlying changes, there are some substantial application changes as well. The Konqueror browser, which has acted as an advanced file and web browser in KDE 3, has been retained as the web browser, but Dolphin now comes as the new default file browser. It takes the best features from Konqueror, while simplifying the interface and making it more suited to file browsing. Users of Gnome's Nautilus or Mac OSX's Finder will be familiar with the side pane, where bookmarked folders or external drives can be accessed quickly. Dolphin also allows you to rate, tag and add notes to files, a feature set to become increasingly popular with people used to using sites such as Flickr and Youtube. Gwenview has been ported to KDE 4 and now becomes the default image viewer, again with a simple interface that lets you browse quickly through image files. The systems settings application replaced kcontrol, giving easier access to desktop, network and administration settings. Finally, many other applications have improved greatly since KDE 3, with changes such as the bundled games having much higher quality SVG graphics.

And so, 10 years on, KDE 3.5 has grown to become a stable, integrated and advanced desktop

Kalzium, a KDE 4 education program



While KDE 4.0.0 is not suitable as a day-to-day desktop environment, each month will see a new 'point' release, with KDE 4.0.1 having been released at the end of January. The next main release of KDE 4 is expected in July 2008, as version 4.1.0. This is expected by most to be the first mainstream version, and it will include KDE 4 versions of the PIM suite software (email, news, and instant messaging software), as well as stable OSX and Windows versions of the desktop applications.

Running KDE 4

It's important to remember that early versions of KDE 4 are not suitable for use as a full day-to-day desktop. People looking just for that should stick with KDE 3.5 for now, and consider KDE 4.1 later in the year. Having said that, most people willing to give Linux a go are a bit more curious than that, and there are easy ways to get KDE 4 up and running if you want to explore the new desktop.

The quickest way to get going is to download a live CD that presents you with a KDE 4 desktop ready to run. Naturally, running from CD is far from ideal under normal circumstances, but may be the better option if you only want to have a quick look around. At the time of writing two such CDs were available, one from OpenSUSE (**http://home.kde.org/~binner/kde-four-live/**) and the other from Kubuntu (**www.kubuntu.org**).

For a hard drive installation, if you run Ubuntu or Kubuntu 7.10, a separate repository has been set up with KDE 4 packages. These can be installed alongside your current desktop (be it Gnome or KDE 3.5), and you can log into KDE 4 by selecting it from the login manager.

Head over to **www.kubuntu.org** for instructions on how to enable the repository. The steps are straightforward, and the installation of the desktop requires little more than 'sudo apt-get install kde4-core'. **PCW**

Ken McMahon is a freelance journalist and graphic designer. His involvement with digital cameras began with a Commodore 64. He graduated to Macs and now works mostly with PCs.

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Call in some backup

Without negatives how do you keep your digital images safely backed up?

Next to completing a self-assessment tax return, backup and archiving has to be one of the most tedious tasks going. Which is, of course, why many people don't bother and why those who do put it off for as long as they can.

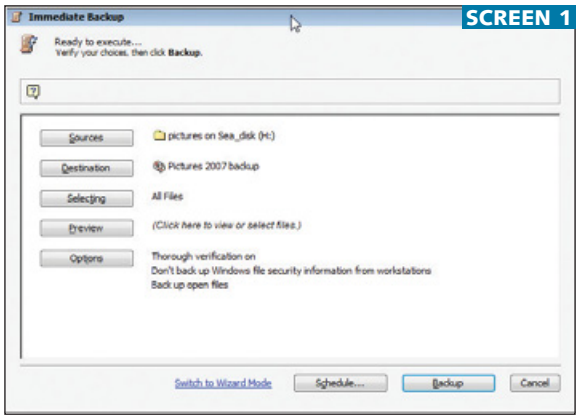
If you're one of those rare sorts who has a clockwork system of rotating daily, weekly and monthly backups for your digital image and video library, congratulations. If you're still with me, my guess is that you've got years' worth of photos and videos spread across several hard drives. Some of these may have been archived to CDs and DVDs on a sporadic basis, but there nonetheless exists that horrible nagging doubt that if everything died on you there'd be a lot of precious memories that would be, well, just that; you would never see them again.

Photo archiving is a much more personal affair than other data storage issues. What suits me may not suit you – a lot depends on how and why you take pictures and what you do with them afterwards.

For those who make and use images professionally backup is, arguably, more important than for a personal photo collection and what works for a wedding or event photographer may not be the best option for a casual snapper or committed amateur photographer. In the remainder of this month's column I'll look at some of the issues involved in backing up and archiving your photos, discuss some of the available options and talk about how I do it.

A picture of organisation

I take photographs mainly for pleasure, but also for my work as a graphic designer and to illustrate books and articles I've written. In 2007 I took just under 7,000 digital photos (a surprisingly small number and fewer than I took in 2006; I must get out more).



Include your photo folder in your regular backup routine

For me, the main issues with archiving are security and ease of retrieval. Primarily I need to know that my photos will be safe and that the media on which they are stored won't degrade or fail so that I am unable to retrieve them. When I do need to access my pictures I want to be able to locate them quickly.

The key to the first issue is redundancy. You can argue all you want about the useful life of hard disks or the longevity of optical media, but the only sure way to be certain that a media failure won't destroy a large chunk of your archive is to keep more than one copy.

The solution to the second part is organisation. The more you do initially to organise and tag your photos, the less time you'll spend looking for them and adding essential metadata later.

I store all my photos on a single external Seagate 300GB Firewire drive. So far this has been large enough to accommodate every photo I've taken in the 21st century and still has room to spare, though with higher resolution RAW files this is unlikely to continue to be the case for long.

This drive is included in my regular backup routine and I also archive new material at the end of every month. I use Retrospect Professional for regular backups (see screen 1), and copy the monthly folders using a DVD burning application. I feel more comfortable with my long-term photo archive DVDs in a format readable by the computer's operating system, rather than tied to a particular piece of software.

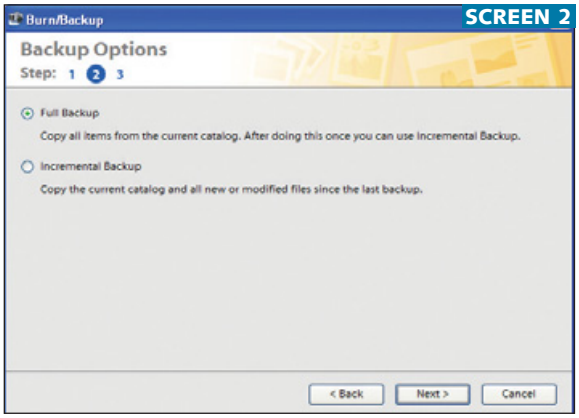
Increased capacity and reduced storage costs mean it's now possible for most of us to store our entire photo library on an accessible hard drive. Sometime soon I'm going to have to upgrade the external drive to something larger, but even if dSLR sensor sizes and my annual shooting rate both double, I don't see continued online storage of my photo library being a problem.

Being able to keep your images online has obvious advantages from the search and retrieval perspective, but if you're restoring from a backup these options won't necessarily be available to you, and that's where organised filing can help.

Filed away

I find it useful to organise my photos by date. At the beginning of the year I

Photoshop Elements provides incremental backup of photos and its Organizer database



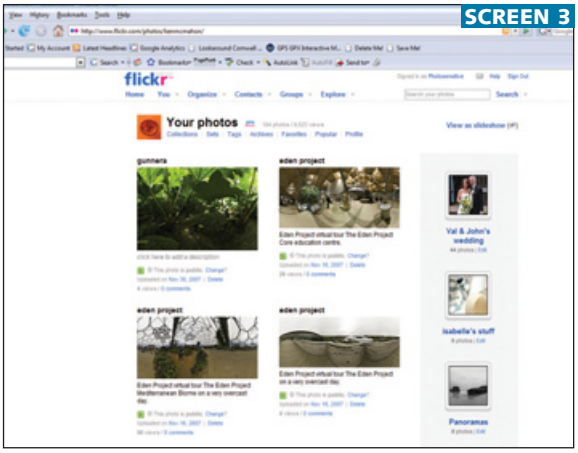


Photo sharing sites like Flickr are a good bet for off-site photo backup

Off-site backup with photo sharing sites

Uploading all of your photos to a photo sharing site like Flickr (see screen 3) is one way to provide an extra level of redundancy, as it's off-site and so provides protection against theft and natural disaster.

Unless you take very few photos, you'll need to pay for sufficient storage space. A free Flickr account gives you 300MB and also downsamples your image uploads, but for £25 a year you get unlimited storage and can upload full-resolution photos.

You can set privacy options so that no one but you, friends and family can see your worst efforts and Flickr will also keep your keyword tags so you can search your photos online.

Other photo sharing sites that offer similar services include Smugmug, HP's Snapfish and Google's Picasa web albums.

If you're not interested in the sharing and other features offered by these sites, straightforward online storage is another option. Try visiting **www.xdrive.com** or **www.mediamax.com**.

For online backup of large amounts of high-resolution photos or video, Amazon's S3 (**www.amazon.com/gp/browse.html?node=16427261**) is hard to beat and has good security, but is less than straightforward to set up (see screen 4).

Smugmug uses S3 to store millions of its subscribers' photos.

If the S3 setup looks like a bit of a fuss, one of the S3-based online backup services such as Jungle Disk (**www.jungledisk.com**) or Elephant Drive (**www.elephantdrive.com**), though more expensive than using S3 direct, might prove easier.

create a folder and name it, for example 2008, and create 12 folders within it, one for each month. When I download a photo session it goes in its own sequentially numbered folder within the folder for the current month. I don't bother renaming individual files and if I edit an image I save it in a subfolder called 'edited'.

If you plan to keep the original file names for your photos, and your camera provides the option to use sequential file numbering rather than resetting each time you format or insert a new card, then I'd advise you to make use of it. That way, all of your photos will have unique file names and the potential for confusion and mishaps will be greatly reduced. The only other thing I do at this stage is to add a copyright line to the relevant IPTC metadata field and add keyword tags.

'One of the advantages of backing up from a photo library application is that the file database is saved along with the photos'

Applications like Adobe Photoshop Elements, Corel Mediaone (included with Paint Shop Pro Photo X2), Google's Picasa 2 and professional applications like Adobe Lightroom and Aperture for the Mac all provide routines for backing up and restoring your photo library (see screen 2).

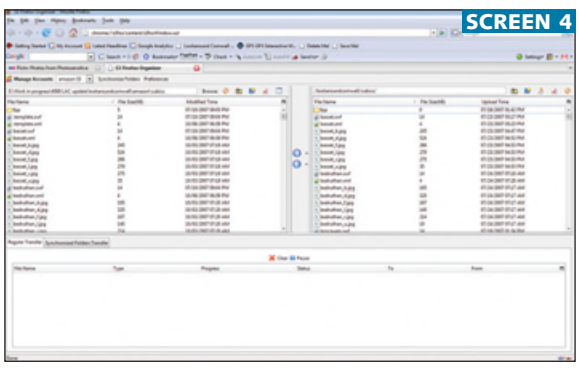
Photoshop Elements allows you to back up the Organizer catalogue and image files to optical media or to a separate hard disk or partition and will do incremental backups – archiving only modified and new photos that have been added since you last backed up. Like most photo library applications it also keeps track of how much time has passed and how many photos you have added since the last backup, providing timely reminders or, if you like, nagging you to back up when appropriate.

One of the advantages of backing up from a photo library application is that the file database is saved along with the photos. The database contains a copy of the thumbnail and metadata for each image, speeding up display and search and retrieval operations.

It also keeps track of what's been backed up and when, so that incremental backups can be done. If nothing else, one of the major advantages of backing up this way, or using a backup application rather than simply dragging folders of photos from one place to another, is that you avoid duplication.

Another plus is that it makes life much easier when you upgrade your PC – installing a new hard disk, or replacing the machine altogether. Restoring your photos to a new drive using the backup routine puts everything back exactly where it was, complete with the catalogue. Photoshop Elements' backup routine also lets you restore to a new location while maintaining the original internal file structure.

Amazon's S3 'pay for what you use' service is an economical solution for large-scale off-site backup



There are a couple of things it's worth knowing about if you use or are planning to use Elements to back up your photo library.

The first is that if you back up to a folder on your hard drive, Elements renames the files to prevent multiple files with the same name occurring in the backup folder.

The original names are restored when you restore the files from the backup, but you won't be able to identify the files (from the file name), at least by examining the contents of the backup folder.

The second thing is that if you use backup and restore to transfer your photo library to a new machine, the catalogue files, thumbnail cache and other important data are stored in the default location C:\Documents and Settings\All Users\Application Data\Adobe\Catalog Folders.

If you want to move this, say to the location you restored the catalogue to, select Edit>Preferences>files, click the Browse button next to 'Folders for Saved Files' and navigate to the

Tim Nott is a full-time freelance journalist. When he's not writing about Windows and word processing, he tackles many other diverse subjects. He currently lives in France with his wife and family.

→ Comments welcome on the Word processing column.
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Please do not send unsolicited file attachments.

Pack up your troubles

Take a look at what's inside the Microsoft Office Update kit bag

In recent months we've seen a profusion of Microsoft Service Packs, with Vista SP1, XP SP3, Office 2007 SP1 and Office 2003 SP3.

The last of these is an agglomeration of previous updates (which most users will already have installed via Windows or Office Update), improvements to stability developed in response to user error reporting and a number of new security features.

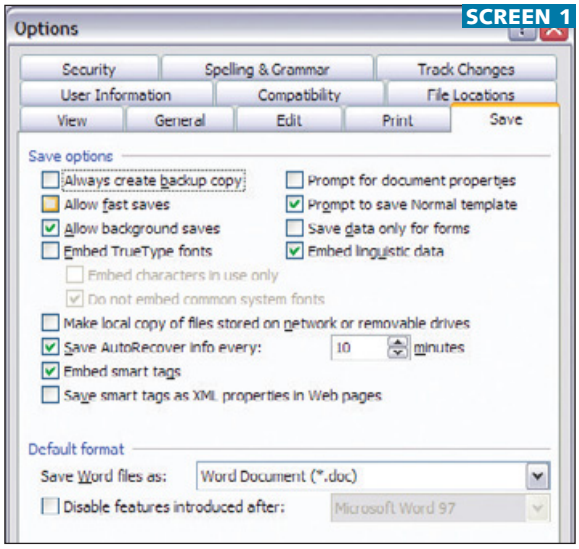
This last, in Microsoft's tough talk, "represents a major evolution in security for Office 2003. It further hardens the office suite against potential attacks and security threats".

There are several ways of obtaining the Service Pack. The one recommended by Microsoft is via Windows Update. Windows XP and 2000 users can also use Office Update. You can also download the pack as an executable file of 117MB. This has the advantage that you can save the file and subsequently install it on other PCs without further downloads.

But be warned, there is no way of uninstalling this or other Office 2003 Service Packs. You would need to remove Office entirely, then reinstall. In theory it should be possible to remove the Service Pack via System Restore, but Microsoft makes no mention of this and, in any case, Restore Points have a limited life.

We'll concentrate on changes that impact Word, but be aware that other Office components are also affected.

One casualty is the 'Fast saves' option (Tools, Options, Save). These, instead of amalgamating changes to a document in a logical manner, append them to the document. This has several repercussions – it can lead to bloated files and the inclusion of deleted text that, though hidden from Word, may still be visible with a text editor. In addition, it doesn't save much time. We've long advocated turning this off and it was removed from Word 2007, so this is good news. However, Microsoft hasn't made a very thorough job of it – the checkbox is still present, though we are informed it is no longer functional (see screen 1).



The Fast Save checkbox no longer functions in SP3

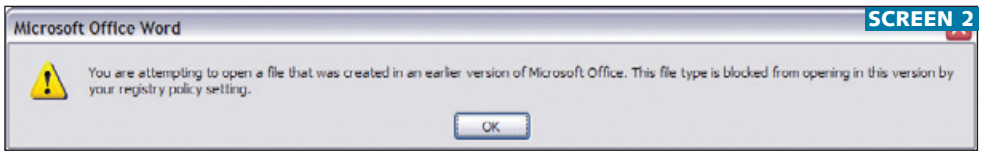
Administrators can allow or disallow .com add-ins, although this requires some Registry or Group Policy editing. There are minor changes to the behaviour of Document Imaging. The default printer driver is set to the TIFF format, but TIFF and MDI files will no longer open by default in Document Imaging, and you will no longer be able to compress TIFFs using JPEG compression. Although there is no workaround to that last restriction, it is possible to reset the default behaviour of TIFF and MDI files via Windows Explorer folder options.

The real crunch, however, as some readers have already found out the hard way, is that SP3 denies access to certain file types. These include Corel Draw (CDR) files, which may not be too much of a drawback, and Word for Windows version 1 and 2 documents.

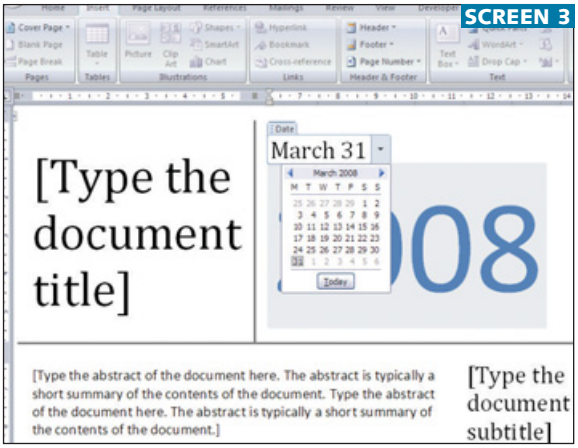
So, if you have some Word files that have been lurking on your hard disk since 1994 or earlier you may not be able to open them as "opening and saving these file types may pose a risk to you" (see screen 2). This may seem somewhat dramatic, not to say surreal, to many Word users who hitherto have lost little sleep over the revenge of the ancient killer documents, but Microsoft is either deadly serious or playing an elaborate practical joke on us. Fortunately, this is reversible.

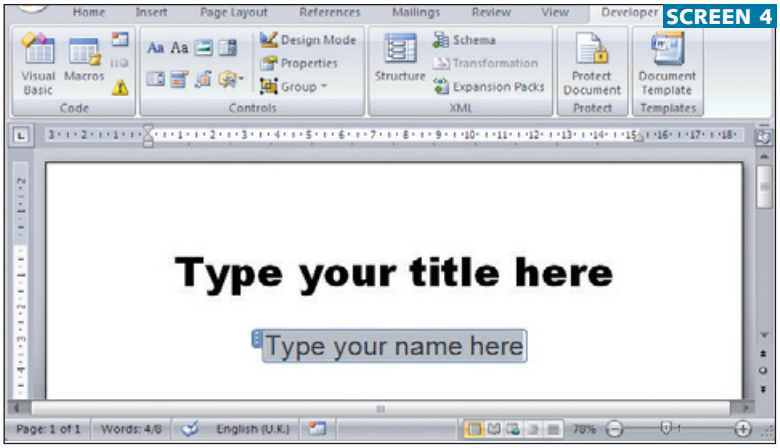
If you go to **http://support.microsoft.com/kb/938810** you'll find downloadable Registry patches or, for real hands-on enthusiasts, instructions for creating your own.

So if you've kept your Office 2003 installation updated, don't have stability problems, are not afraid of Word 1 or 2 documents and can turn off Fast Saves all by yourself, there's little incentive to install SP3. If, on the other hand, you're installing Office 2003 from scratch, then SP3 provides a handy way of updating it in one hit. Note that SP3 incorporates the two previous Service Packs. You'll find further details of SP3, together with the download links at **http://tinyurl.com/2zf3ox**.



SP3 blocks old Word documents





Content Controls

Last month's foray into Word 2007 Building Blocks, mentioned, in passing, 'type here' boxes. If, for example, you select a cover page from the gallery, you'll find formatted placeholders for titles, subtitles and document abstract. Click on any of these and you can insert your own text, which will replace the placeholder text while retaining the latter's formatting. You also get similar boxes for dates, but in this case you can click beside the 'Pick the date' box and use a little pop-up calendar (see screen 3). These are officially titled Content Controls, and you may want to try creating your own.

First, if the Developer tab isn't visible, you need to enable it from Word Options, Popular. Next, turn to the Developer tab and in the Controls panel you'll see eight buttons on the left. If these are greyed out, this is because you are working in 'Compatibility Mode' – ie the Word 2003 and earlier DOC file format. You'll need to save your document in the DOCX format – or start a new one – to enable the buttons.

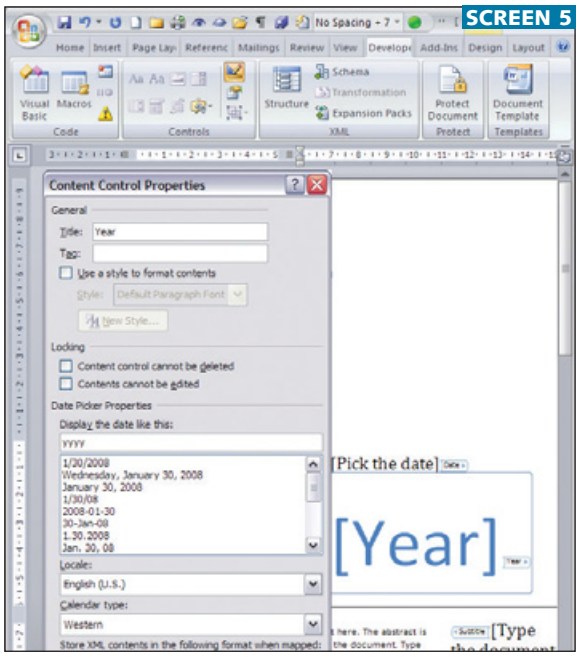
Let's take a simple example of creating a cover page. First, click the top left button in the Controls panel – this creates a Rich Text control. You'll see a box with a handle to the left containing the text 'Click here to enter text'. Do just that – for instance 'Type your title here'. You can enclose it in square brackets, as per the supplied cover pages, but this is not mandatory, it just serves to emphasise that this is a placeholder. You can then click the handle to select all the text and format in the normal way, or right-click to use the formatting mini-toolbar. Repeat the process somewhere else on the page to get a name control – eg 'Type your name here', and format to suit (see screen 4). Finally, with the insertion point at a third location, click on the date button – second from the left on the bottom row. This will give you a box containing 'Click here to enter a date'. Change the text if you want to and format as before.

Left: The pop-up date control

Right: Adding Content Controls

So now you have Content Controls for title, name and date. What can you do with this? First, you can select all (Ctrl and A) then turn to the Insert Ribbon, open the Cover Page Gallery and 'Save selection to Cover Page Gallery'. Alternatively, you could save the document as a DOTX template. In either case, subsequent users can use the controls in exactly the same way as those in the supplied cover pages.

You may have noticed that when you pick a date using the control, it comes out in dd/mm/yyyy format. You may want to change this. So, open the template (or cover page building block) and turn once more to the Developer tab. Click on the Design Mode button, top right of Controls.



Show just the year by setting one of Word's two date control options

Now right-click on the date control, and you'll see Properties has been added to the context menu. Select this, and you'll see you can choose from a variety of date formats, or specify your own. And this is how Microsoft has done the clever stuff with some of the cover pages where the date and year have different formatting, such as the Annual cover. In fact, there are two date controls – one has the format MMMM dd, which just gives the month (spelled out) and day. The other is formatted as yyyy, which just returns the year (see screen 5).

Word for free

Did you know you can get Microsoft Word absolutely free? And it's only a 3.4MB download? Is there a catch? Well, it's not the latest version. In fact, it's not even Word for Windows, but you can download Word 5.5 for Dos (or OS/2) by typing **http://tinyurl.com/65puu** into your browser's address bar. This will start the download automatically – make sure that you save, rather than open or run the file. Having downloaded the file, Wd55_ben.exe, create a temporary folder and move the file there. You can then run the file, which is a self-extracting Zip file, and which will create over 300 other files in the same folder – which is why you definitely don't want to run it from the Desktop. Having done this, run Setup.exe and follow the prompts – by default it will install in C:\Word but you can change this as long as you stick to 8.3 file and folder names. Bear in mind that you need to select items in the prompt lists with the arrow keys, not the mouse. Having done this, run Word.exe, and you're off. You get a semi Wysiwyg view of your document, mouse support, multiple documents, a spelling checker, a thesaurus and macros. Why pay more? **PCW**

Stephen Wells is a freelance journalist and a regular contributor to computer magazines. He's been writing PCW's Spreadsheets column for over 10 years.

→ Comments welcome on the Spreadsheets column.
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The ins and outs of Excel

Import and export data from your spreadsheets using one of four options

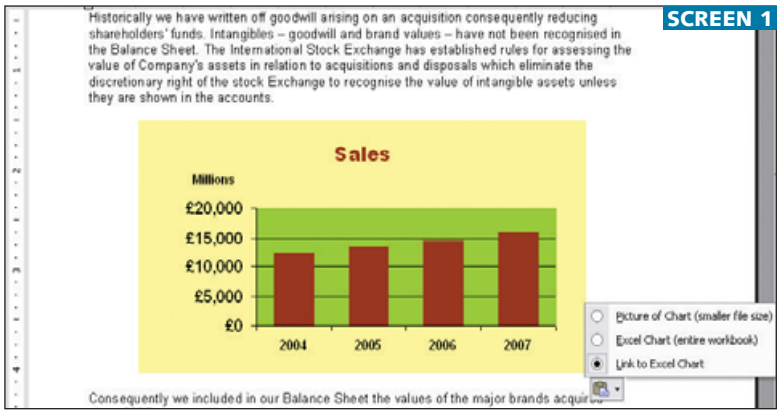
Bearing in mind the frequency with which new versions of software lack backwards compatibility, it was heartening to receive a message from Michael Hart: "Since the days of Multiplan, father of Excel, I have been running a portfolio system for share valuations with many intersheet links which depend on picking up share price information, using DDE links, from Updata's Technical Analyst program."

Fancy that. Imagine anything that would run with any version of Excel all the way back to its predecessor. It's true that Michael was writing because he found that the DDE links wouldn't work with Excel 2003. I referred him to the Office 2003 Editions Resource Kit, see **http://support.microsoft.com/kb/279721/en-us** in the Microsoft Support Knowledge Base. But it got me thinking about other ways of entering data in a spreadsheet instead of using a keyboard.

Dynamic Data Exchange (DDE) was very popular at one time. It was a protocol for exchanging data between Microsoft Windows-based programs that is now considered insecure. The User's Guide for Excel 4 described how to write DDE command macros to start, send data to and retrieve data from other applications. You could even direct Excel to send keystrokes to other applications.

These days Microsoft recommends using object linking and embedding. It's safer because self-written macros aren't involved. The instructions are included in Excel's code. Alternatively, you can import or export data.

Embedding and linking let you put a document from one Windows application into another. Both documents remain in their original format though. If you embed an Excel table in a Word document you can still use Excel to edit the embedded table. If you use linking, the copied information can be refreshed when the original Excel table is changed. You might have a Powerpoint presentation that relies on information from an Excel worksheet. When you update the data on the worksheet, the presentation can automatically be updated if they are linked.



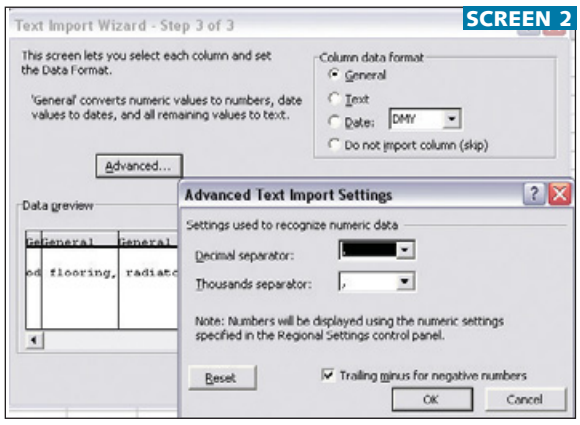
An Excel worksheet can be embedded in a Word document

If you have no reason to combine documents but want to use data from one application in another then importing or exporting is more appropriate. You might have a list of names and addresses in a Word document but want to create a simple database from them. You can either export them from Word to Excel or open Excel and import them.

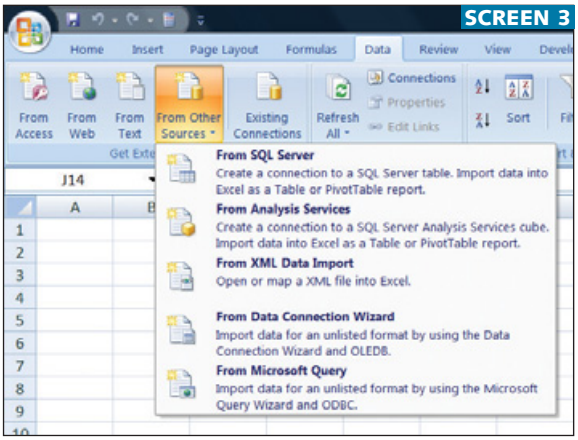
Embedded reports

Embedding data from Excel into a Word document is easy. You might have a Word document that will eventually become a page in an annual report and an Excel chart of comparative sales figures. Open both files. Right-click on the chart and choose Copy. Switch to the Word document and click where you want the chart to appear. On the Edit menu choose, Paste Special. In the displayed dialogue box choose Paste or Paste link and Microsoft Excel Chart Object. The chart will appear in the word document with a Smart Tag (see screen 1). This offers you the choice of having just a picture of the chart, an embedded chart, or a link to the original.

If the chart is linked, and you change a value on the original, the change will immediately be reflected on the chart in the Word document. If the chart is embedded, there is no link but Excel facilities are available so you can make changes to the chart in the Word document. If you have chosen to have just a picture of the chart then it becomes a graphic and there are no Excel editing facilities.



The Text Import Wizard helps create worksheets from text files



Options to create links to data in other sources

Importing

Apart from DDE and OLE (Object Linking and Embedding) there are other ways of transferring data into an Excel file, including ODBC (Open Database Connectivity), OLAP (On-Line Analytical Processing), and SQL which is a computer language for retrieval of data developed by IBM in the 1970s.

You are offered a wide range of options under Open on the File menu (Office, Open, in Excel 2007). You can import data straight from Access and dBase files. With other files just compare their extension with the numerous extensions offered by Excel. Some bring in files from other spreadsheets. Depending on your version of Excel you might find options to import files from Lotus 1-2-3, Quattro Pro, Foxpro, Oracle, Paradox and Microsoft Works.

Some formats are maintained from days gone by like SYLK, the Symbolic Link format used by Multiplan and DIF, the Data Interchange Format used by Visicalc.

When all else fails most other programs will export a text file. Choose the option, Text Files (*.prn; *.txt; *.csv), select the file and Excel will open the Text Import Wizard offering numerous options for laying out the file on a worksheet according to your wishes (see screen 2).

You'll notice there are other options for importing data on the Data menu (Data tab in Excel 2007, see screen 3). Data imported this way is linked to the original source, whereas data imported using File, Open is simply a copy of it.

In versions of Excel prior to Excel 2007 you can interact with an HTML web page. You can open an HTML file in Excel 2007 but for security reasons and because the interactive feature didn't work with browsers other than Internet Explorer, that's it. The interactive feature has been replaced by Excel Services, which requires Office Sharepoint Server 2007. For more information about this see, 'Publish a workbook to Excel Services' in the Excel 2007 Help files.

If you want to import data from a source unrecognised by Excel you can probably find a driver or file converter from the publisher of the software.

Mail merging

One common way of exporting data from a spreadsheet is to use mail merging. It's useful when you wish to send the same letter to a number of people, be they clients, club members, sales prospects or councillors.

With Excel and Word it's particularly easy because Office has a Mail Merge Wizard. Start by creating a mailing list on an Excel worksheet. The top row will have headings such as Title, First Name, Surname, and so on. These are the fields of your database. Each row will be a record and contain the name and address of one recipient. It will be easier later if you include the house number in the same field as the street rather than make it a separate field.Save and close that file. Complete a Word letter template and close that new document too.

'The most common ways of exporting data are by saving it to a storage source or printing it out'

Open Word and choose Letters and Mailings, Mail Merge Wizard on the Tools menu. In Step 1 choose Letters. In Step 2 choose Start from existing document and pick your new letter from the displayed list. In Step 3 click, Use an existing list. Browse to your Excel file and then the right worksheet. Oddly, the field names and their columns may be in a different order (see screen 4). You can drag them around into the correct order with the mouse but it hardly matters as Step 4 gives you an opportunity to match the field names Word expects in an address block with the field names you have used.

Follow through with the rest of the Mail Merge Wizard to Preview, Save and Print your letters.

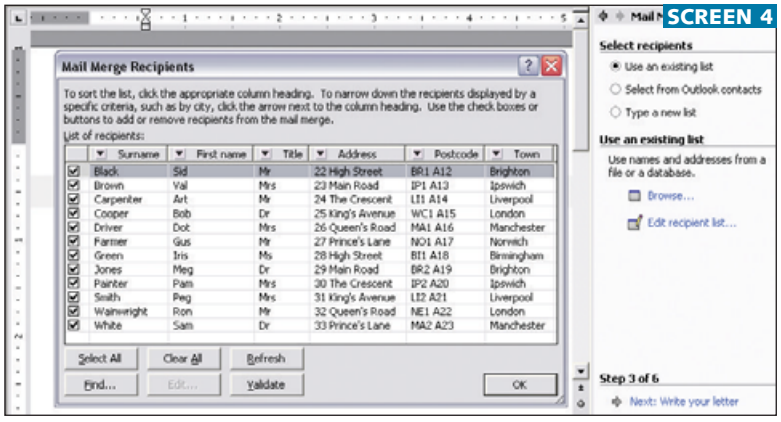
Now hear this

The most common ways of exporting data from an Excel file are by saving it to a storage source or printing it out. But you can also have audio output. If your PC has a sound card, and your speakers are switched on, you can have Excel proof-read your cell entries back to you.

On the View menu choose Toolbars and then Text to Speech. (By default, the facility isn't available in Excel 2007 and is undocumented. To add it, click on the down arrow at the right of the Quick Access Toolbar at the top left of the screen. Choose More Commands, Commands Not in the Ribbon. Click Speak Cells and the Add button, then Stop Speaking, Add. Click OK.)

Highlight the range of cells you wish to have read back to you and, on the toolbar, click Speak Cells. If the voice is male and you would rather have a lady read to you go to Start, Control Panel and choose Speech. (Text to Speech in Excel 2007.) Under the Text to Speech tab you can change from Michael or Sam to Michelle. The quality is much better in Excel 2007. In prior versions all the voices sound similar to Stephen Hawking's familiar speech machine.

The procedures described in this month's column may vary slightly in different versions of Excel but not in any significant way. **PCW**



A letter can be sent to all the addresses in an Excel list

Nigel Whitfield edited computer magazines before going freelance in 1995. A specialist in internet and consumer issues, he has a degree in Computing Science from Imperial College.

→ **Comments welcome on the Web development column. It returns in the July issue.** Email webdev@pcw.co.uk *Please do not send unsolicited file attachments.*

Cook Javascript cookies

Find out how to set and check cookies in scripts on your web pages

In the last Hands On Web Development column in March, I explained how you can use pop-up windows on your website, launching them from a short piece of Javascript.

But, of course, many users aren't keen on pop-ups, even if they remind them of something quite important. So it's a compromise and sometimes part of that compromise might be not displaying a pop-up for a certain amount of time, such as seven days. A solution for handling that is to use cookies.

The cookie monster

Some people have an aversion to cookies, mistakenly believing that they can allow your computer to send private information to a website. That's not really the case – they can only send back to a website some information that it sent to your computer in the first place, like your user ID on the site, or something that helps them see which user has looked at which pages.

A cookie consists of a few bits of data, stored as text on your computer. There's a name, a value for the data – perhaps your ID for the site, or a set of preferences, or simply 'true' or 'false'; anything that can be saved as text – an expiry date, a path and a domain.

Those last three are the elements that we're interested in here.

The Expiry date is the date on which the browser can safely discard the cookie. If it's not set, then the cookie is a 'session cookie' which means it'll disappear when you quit the browser, otherwise it'll be stored until the date, which is specified in a fairly strict format.

The path restricts the cookie to a section of your website. If it's set to '/' then the cookie will be returned to the web server for every page on your site. Set it to, say, '/shop' and only pages on your site with URLs starting '/shop' will see its value.

The domain works in a similar way, but can restrict the cookie to part of your domain, or those higher up. If you have a domain mysite.example, then setting the cookie to that would allow it to be seen on websites at forums.mysite.example, or www.mysite.example.

Set it to forums.mysite.example, and the main website won't get the cookie, either.

SCREEN 1

Cookies in Javascript

So, now you know how cookies work, how are they handled in Javascript? Not elegantly would be one way of putting it. In a PHP script, and other languages, you can easily see the value of any single cookie. Not so in Javascript.

First, though, how about setting a cookie? All you do is set a value called document.cookie to whatever you want, like this, which sets a cookie called 'popupshown' to the value 'true':

```
document.cookie = ↙
'popupshown=true; ↙
expires=Thu, 14 Feb 2007 ↙
12:00:00
UTC; path=/'
```

(Key: ↙ code string continues)

You could add a domain too – it's just another parameter, which could follow the path option, after a semicolon. Omit the expiry information and you just get a session cookie; set it to a date in the past and you'll delete the cookie.

And if you wanted to set another cookie, just do the same thing again – you can have lots of cookies on a page and, although it looks as if when you use document.cookie you're setting a variable, that's not really the case – you're telling the browser to set the cookie, and so setting another one with a different name won't overwrite the first one.

So how do you see cookies? This is where Javascript becomes somewhat less than elegant; document.cookie is a single string, containing all the cookies applicable to the page (based on the domain and path info).

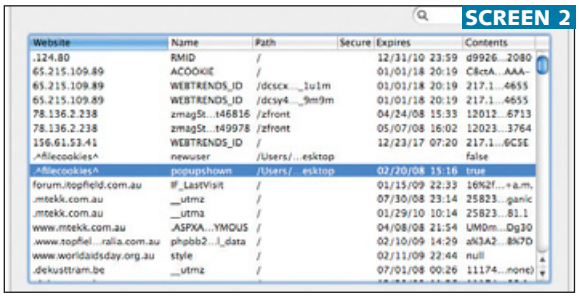
Suppose we'd set another cookie, to indicate a user was an old hand on our site, newuser=false. Put a little code like this in a web page:

```
document.cookie = ↙
'popupshown=true; ↙
expires=Thu, 14 Feb 2007 ↙
12:00:00 UTC; path=/' ;
document.cookie = ↙
'newuser=false' ;
document.write ↙
(document.cookie);
```

As you can see in screen 1, what's sent back is a single string that contains all the cookies, separated

Setting cookies is very simple and you can display them all with just one line of code

If you're not sure cookies are being set OK by your scripts, check your browser to see exactly what's happening – we didn't expect the Path on ours to be so restrictive



SCREEN 2

Using defensive programming

One aspect of web development that's often overlooked – and not just by non-professional site builders – is testing. When you have a straightforward site with just HTML pages, it's not hard to check that all the links work – and your web-editing program may well do it for you.

But when you have scripts, whether Javascript, PHP or anything else, things can be a lot more complicated. Add a database into the mix and it can become even more important – you don't want to run the risk of people seeing the wrong information, or information relating to another site user. That's the sort of mistake that you read about all too often, where an e-commerce site has a flaw that allows users to simply change one element of the URL, and see information about someone else.

Defensive programming is one way to try and help prevent this – you can avoid, perhaps, having the site controlled via URLs that include giveaway info, like parameters such as customerid=11234; and where it's unavoidable, don't assume that just because you have a customer ID set, the correct matching password has also been supplied to get to the page, and so on.

Testing is the other way to check; it might seem very tedious, but if your site uses scripts, and allows users to enter options that take them to other sections, or place orders, or update and view information, then you should seriously think about writing down a rigorous test script to check that things work properly. It can start with

Testing a website thoroughly can be tedious – but it can be automated with a product such as iMacros, saving much time

something as simple as noting down, say, the procedure that you expect someone to follow when they sign up to your site. Write simple instructions, and define what's a pass or a fail.

For instance: "Enter a username that you know already exists on the sign-up page; pick a password. Click 'Sign up'. Does the site correctly determine that the name exists, and ask the user to try again?"

And when you've tested the things you expect people to do, test the things you might not have thought about; say you have a script that shows the orders a customer has placed. Include in your script a test for what happens when someone goes straight to that page, so the customer parameter isn't set, or is set to 0, or to *; do they see nothing? Are they bounced to a login page? Do they see details for all customers' orders, because you've been lazy in the way you search the database?

Thinking of all the different ways things like this might happen can take a long time – certainly when you start to include the ways in which people might deliberately try to break your site. But if you want to be sure your site's behaving the way it should you'll probably end up writing a website that's much harder for people to break. Thankfully, testing can be automated with tools such as iMacros. It'll still take time, but your site will be more secure as a result.

by a semicolon, so if you have multiple cookies, you then have to split the string to see which cookies are set.

And, of course, since you use semicolons to separate the options when you create cookies, you have to make sure that you don't use them for the actual value.

So, you're going to need a couple of functions to make cookies a little more manageable; first, how about getting that expiry date right?

In Javascript, you can get the current date and time via a Date object – in milliseconds since 1 January 1970. Say you want that cookie to expire in seven days time, that's 7 days x 24 hours x 60 minutes x 60,000 milliseconds.

Object variables in Javascript have 'methods' which are like functions, which you append to the variable name, like this, setting the expiry time to seven days from the current one.

```
expiretime = new Date() ;
expiretime.setTime
(expiretime.getTime() +
7*24*60*60000) ;
```

And we can join two bits of a string together using the + operator, like this:

```
document.cookie =
'popupshown=true; expires=' +
expiretime.toGMTString();
```

Screen 2 shows the cookie list in our browser after we've added this code to a sample page; as you can see, the highlighted line shows a date seven days after the page was displayed.

Reading the cookie is a little more challenging; we have to search through the document.cookie value to find the name followed by an equals sign, and then look at everything from there up to the next semicolon.

Here's one, very basic, way of doing it (see screen 3):

It's not as simple to read a cookie in Javascript as in some other languages, but it can be done with a few lines of code

```
cookiename = 'popupshown' ;

if (document.cookie.indexOf
(cookiename) != -1 )
{
  cookiestart=document.cookie.
indexOf(cookiename)
+cookiename.length+1 ;

  cookieend=document.cookie.
indexOf(';',cookiestart-1);

  value = document.cookie.
substring(cookiestart,
cookieend);
} else {
  value = 'not set' ;
}

document.write('<p>Pop up
value is ' + value + '</p>') ;
```

SCREEN 3

There are a couple of new methods in there – indexOf searches a string to find where a substring appears, and substring extracts the characters between two points.

There's little in the way of error checking here, and if you're using cookies a lot, it's a better idea to wrap this up into a function, so you can just say something like

```
value = getCookie
('popupshown') ;
```

but that, as they say, is an exercise for the reader – or for one of the many free Javascript libraries on the web. **PCW**

Alan Stevens has implemented and supported networks for over 25 years, working for IT vendors, system integrators and customers. He now mostly researches and writes about networking matters.

→ Comments welcome on the Networks column.
Email networks@pcw.co.uk
Please do not send unsolicited file attachments.

Vista SP1 and other matters

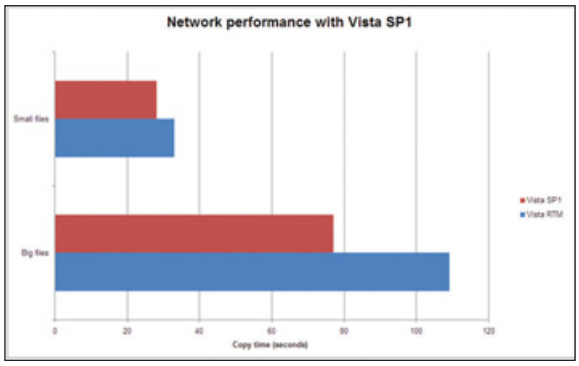
Find out if Service Pack 1 will be the answer to your Vista network grumbles

There's been a lot written about the forthcoming Service Pack 1 (SP1) update for Windows Vista, with some beta testers claiming significant performance increases, especially when it comes to handling network files. Others, however, have reported hardly any improvements at all, so I thought I'd run a few quick tests myself to see who was right. Nothing exhaustive mind, just a few network file copies with and without SP1 installed to see what effect, if any, the update might have.

Fortunately, I had a Windows Vista PC in for review at the time and, having finished benchmarking it, was able to use that for my tests. The PC in question was from HP and nicely specified with a 2.66GHz Intel Core 2 Duo 6750 processor with a couple of gigabytes of memory and running Windows Vista Business. It also had a gigabit Ethernet interface, which was important as it meant I didn't have to worry about bandwidth issues. To this end I ran tests copying files from a network-attached storage (Nas) server, which was also equipped with a gigabit Ethernet port, with a gigabit switch in between.

I performed two tests. The first involved copying large files from the Nas server to the PC hard disk (a 3.0Gbits/sec Sata drive), for which I used some CD-Rom images, with three of the files involved totalling 1.3GB. For the second test I used a collection of much smaller files, involving some 300 digital photographs, which together totalled 368MB.

The tests were automated and the times recorded, with each run several times to make sure the results were repeatable. I also rebooted both the PC and Nas server between tests to eliminate any cache effects which might otherwise have skewed the results. I ran the tests first using the PC with Vista as it was delivered and with all the latest updates installed. I then downloaded the public beta of the Vista SP1 release candidate, installed it on the PC (a lengthy process, about which more later), and reran the tests several times. The results are in the graph above.



With Vista SP1 applied, I saw significant reductions in the time it took to copy files from a network server

Note that I've simply graphed the raw times for each transfer, so the shorter the bars the better and, as you can see, there was a significant reduction in the time taken once the Vista SP1 update had been applied. This was most obvious when copying the big files, with a reduction of around about a third. That wasn't carried over to the small files, but that was to be expected and the impact was still noticeable.

I'm not claiming to have produced anything definitive here. The Nas server I used was a Linux box running Samba and the results with a Windows server might be completely different – according to some reports I've seen they should be even better. It's also worth noting that when I ran the tests in the opposite direction, copying files from the PC to the server, there was no measurable change once SP1 had been applied. There have also been changes to the SP1 software since I downloaded my copy, which may have an impact on your own results.

Installing the Service Pack

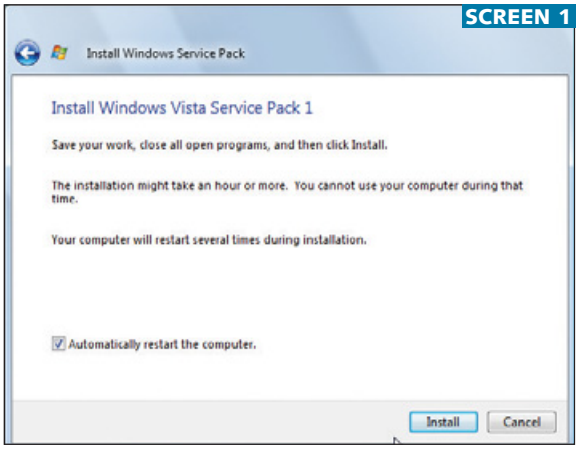
Bearing all that in mind, these results do demonstrate a measurable effect, and it's fair to say that anyone who installs Vista SP1 can look forward to enhanced network performance. I do, though, just want to share my Vista SP1 upgrade experience with you, as it wasn't what I was expecting. Indeed, having installed lots of Service Packs over the years, on Windows XP and before that on Windows 2000, I thought it would be a fairly quick and painless process. It wasn't.

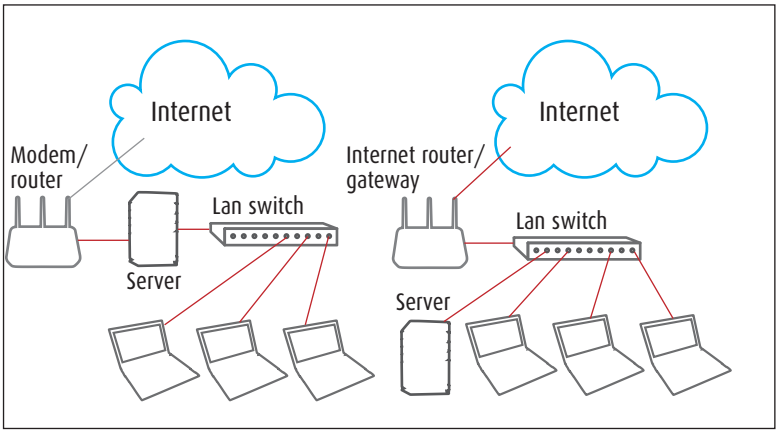
To start with, the standalone version of the download is pretty chunky (436MB) and when you run it you're warned that it could take an hour or more to load. And that's exactly what it needed, even on the PC I was using, which had a pretty clean install of Vista on it. Added to which it also needed a couple of reboots and there was an awful lot of processor and disk activity.

Goodness knows how long it would take on a machine that's been in use for a while with other applications installed. That's an issue that hopefully will be addressed before SP1 is finally released, although it's still likely to cause a lot of pain.

You're warned that the Vista SP1 update could take an hour or more to install, and it can

SCREEN 1





Although a server can be configured to act as an internet gateway, it's more common to have a separate hardware router and for the server to be just another Lan node

Servers and internet access

Next, I want to clarify a few things about network servers, in particular the role they play in connecting a local area network to the internet.

A server can be used as a gateway between the network and the outside world. Indeed, when Microsoft first launched its Small Business Server package, that was the preferred setup, with the server able to act as a firewall, anti-virus and spam filter for everyone on the Lan. More recently, however, this kind of setup has fallen out of favour and on most networks you'll now find servers attached as nodes, just like desktop PCs, with a separate hardware router or gateway appliance to connect the network to the internet, as in the diagram.

'I have several Homeplug devices in my house, all happily communicating with each other'

Configured this way, internet connectivity can't be compromised by software or hardware problems on the server. Likewise, if problems with internet connectivity arise, the server and any applications running on it won't be affected by attempts to resolve them.

By the same token, however, rebooting the server won't fix internet connectivity issues, as it often will where the server is used as a gateway. It won't normally do any harm, but it won't restore internet access either. For that you need to reboot or change the configuration of the router.

Another benefit is that it doesn't really matter to the server what router or gateway hardware you're using, just as long it works. That's something I think worth pointing out, as I've been asked a number of times recently what router or gateway to use with Windows Home Server. The answer is that it doesn't matter, as long as it delivers the required internet connection over an adequate network pipe, and with the kind of firewall and other security features you require. That applies to other Windows server software too. If your network is already connected to the internet via a router, and you're happy with it, there's no reason to change it just because you're adding a server.

Homeplug plaudits

Finally, to finish this month's Networks Hands On I want to talk a little more about Ethernet over Power, also known as Powerline or Homeplug products. I've banged on about these little devices quite a bit before and it's fair to say I think they're great. However, judging from my inbox some of you remain unconvinced. Security is one issue I'm often asked about, along with whether or not they can communicate when plugged into different AC ring circuits. Let's start with the ring circuit issue.

I got an email from a reader recently who had asked about this in a popular electrical retailer only to be told that, although everyone said it should work, they got a lot of returns because it didn't. I find that surprising, as I have several devices on different rings in my house, all happily communicating with each other. Moreover, a quick web search reveals plenty of other, independent, reports saying much the same. The only limitation is that the circuits must be terminated in the same consumer unit or fuse box.

I think Homeplug networking devices are great, but others still have security and compatibility concerns

That leads on to the question: "If Homeplug devices can communicate across circuits, will devices in the next house or office, or even down the street, be able to connect to mine?" This is a common security concern and, as part of the Homeplug specification, it's possible to encrypt data such that, should unauthorised devices gain access to your Lan, the data will be unintelligible.

I've always been sceptical that Homeplug networks could be hacked in this way, but have never had the opportunity to test it. So I'm grateful to reader John Sims who emailed me recently with his experiences, the bulk of which I've reproduced below.

"I can report that even within the one house you cannot connect across power points that run from different consumer units, even though both of these units get their feed from the same box in the main meter cupboard.

"In the interests of safety I have a separate consumer unit for my home office, and due to the effect 3ft-thick stone walls have on Wifi signals, thought Powerline would be the answer – the Wifi router is in my office. Not so, they just did not 'see' each other.

"After much cursing, testing on the local (to office) circuit and head scratching, I eventually ran a Cat5 cable to the main part of the house, plugged that into a Powerline plug and bingo, the network is available from any plug on the circuit from the consumer unit that feeds the house.

"No worries at all about security, then, in respect of the neighbours piggybacking the Powerline network. Now getting the Powerline wireless jobby to work is another story."

Of course, as with my Vista SP1 tests, John's experience can't be held as definitive proof, but it adds weight to my doubts as to whether inter-building security is really an issue. My advice would be that, if you're in a flat or shared office accommodation then encryption probably is worth turning on, but if it's the neighbours in the house next door you're worried about, they're unlikely to pose a threat. **PCW**

Mark Whitehorn is one of those lost souls who actually likes databases. He splits his time between consultancy, writing, working for two universities and tinkering with old cars.

→ Comments welcome on the Databases column.
Email database@pcw.co.uk
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Mapping metal

Discover how to link your database to a map and uncover information in new ways

Vic Paine has an interesting proposition: he has Ordnance Survey grid references of the locations where objects have been found using a metal detector. The objects are classified into coins, artefacts and so on. Vic would like to see the grid references as points on a map. What a great project, and yes, happily, it's perfectly possible to do using everyone's favourite database, Access, and a mapping package.

To demonstrate this I'm using the 2004 version of Microsoft's Map Point Europe, which isn't the most up-to-date, but it provides a good illustration of how to proceed: even if you use a different package, you'll probably have to follow the same sorts of step. (I later tried out Map Point 2006 and it behaves just like 2004).

Please do NOT start digging for treasure at these locations; I know absolutely nothing about buried treasure, I chose them at random.

OS references take the form of two letters, followed by two blocks of three numbers, SO 432 933 for instance. The two letters identify the 100,000 metre square of the country (ie each OS sheet – SO, for example, is Sheet 137, Church Stretton and Ludlow). Each OS map is divided into 1km squares by numbered blue grid lines: the first two numbers (43) in the reference indicate the vertical grid to the left of your point and the third (2) is the number of tenths to the right of that grid line your point lies. These three numbers (432) comprise what's known as the 'easting'. The next three numbers (933) are the 'northing' and start with the number of the blue gridline below your point and the number of 10ths the point lies above it. A compete reference identifies a 10m square on the ground.

Imagine a table of data like screen 1.

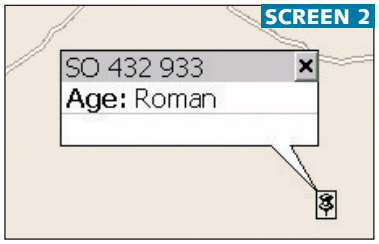
SCREEN 1

Metal : Table

	OSRefID	OSRef	Find	Age
▶	1	SO 432 933	Coin	Roman
	2	SO 425 921	Pin	Roman
	3	SO 437 935	Coin	George III
	4	SO 416 909	Ring	Saxon
	5	SO 405 927	Coin	Roman
*	(AutoNumber)			

Record: 1 of 5

A sample table containing OS grid references

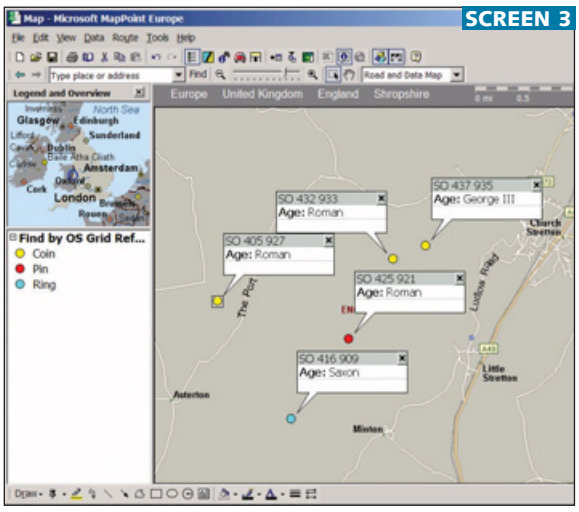


Pushpins are shown with a 'balloon' showing associated data

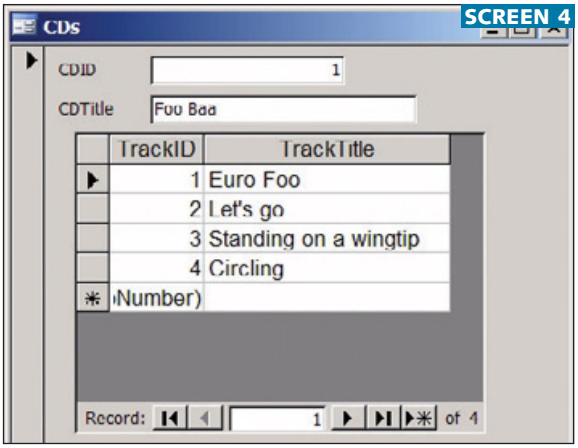
Fire up Map Point, click Data, Import Data Wizard, choose the Access .MDB file type and navigate to the file and Open it. (The sample database is DBCMay08.MDB to be found on the website and the DVD). The wizard presents a list of tables: choose the one containing OS references (called Metal in the sample) and click Next. Check the Country/Region is set to United Kingdom. A list of the fields in the table is shown: pop down the Data type list at the top of the column that contains the OS references and set it to 'OS Grid Reference', then click Finish. You are offered a range of map types.

Simplest is the Pushpin option, which puts a pushpin in the map for each data point. Select this, click Next, and then you can choose the look of the pushpins (different shaped and coloured pins, flags and a whole range of symbols are available). You also choose what is displayed in the information 'balloons' for each pin. Deselect OSRef (otherwise it will appear twice) and select Age, then click Finish and Map Point obligingly displays pins in the map. Screen 2 shows how each pin looks if you double click it. The pushpin set is shown in Map Point's Legend and Overview panel to the left and is called Metal (the name of the table that provided the data).

We could stop here, with our OS points shown on a map, but there are a few more features that could help Vic. One is that Map Point can also show data colour/symbol coded by content. With pushpins in the map as described above, click Data again on Map Point's menu bar and select Data Mapping Wizard. Choose Multiple Symbol, click Next and select the



Map Point showing colour-coded symbols for each type of find with the age of finds displayed in balloons



A standard, auto-generated form, shows the tracks as requested

default 'Edit an existing data map' option. Any pushpin sets are listed below: there's only one so you can just click Next. The pushpin balloons are already showing the age of the find, so here we'll display the find itself: select Find as the data to map, accept the 'Show the data by OS Grid Reference' default and click Next. Now you can play with the symbols for each find. Screen 3 shows the result.

For each OS reference there is now a coloured symbol indicating the type of artefact (a legend is shown to the left), with the age of the find displayed in a balloon.

'Please do not start digging for treasure at these locations; I know nothing about buried treasure'

This demonstration shows that it can be straightforward to export points from a database and display them on a map. Each implementation will vary, of course, depending on the software you use and your particular data. For instance you may have more than one find per grid reference. I had a brief play with two tables with a one-to-many relationship and wrote a query to supply Map Point with the references and find/age data. My old Map Point made no demur at multiple finds at one point but the map display wasn't so good, as it's not easy to see where multiple finds occur since symbols stack one on top of another. (The tables and query are in the sample so you can experiment too). Check that a mapping package will do what you want before you buy: Microsoft's Virtual Earth might also be worth a look and/or Google maps.

Incidentally, Map Point will accept references stored with spaces or without – 'SO 432 933' or 'SO432 933' – or even a mix of both in the same column. It will also import locations stored as latitude and longitude, though these must be held in separate fields. Whether they are west or east of the meridian, and north or south of the equator, should be indicated by a letter. For instance, latitude entries can be in the form 49.46485N or 49.27.53S, and longitude entries as 2.54236W or 2.32.32E.

Mapping data is a truly fascinating area, destined to become even more so with the arrival of spatial data types in the forthcoming version of SQL Server 2008. These will allow the mapping of GPS-type data onto a curved Earth – important if you want very accurate calculation of distance between points – as well as mapping onto flat maps. Functions will be provided that 'understand' these locations and can calculate, for instance, the distance between points or where two objects intersect. It's an area that interests me and, if anyone out there wants more on the topic, let me know.

Two tables better than one

John Holloway asked about his database to store CDs and the tracks thereon: in his current database he wants to list the tracks in one field in a vertical column and is finding he can only list them horizontally.

My experience is that any solution which places many pieces of information into a single field is almost guaranteed to end up causing grief and aggravation. This is true whether you elect to store multiple items in a text field or in one of the new 'multi-valued fields' in Access 2007. As I wrote in October 2006: "It is difficult to stress the problems caused by multi-valued fields too strongly: the relational model is predicated on the notion that each field can only contain a single value."

Putting values into such fields is easy, it's getting it out again that causes so many headaches: querying becomes much more difficult, much less intuitive and very different from querying single-valued fields. My strong recommendation, as you may have guessed, is not to use them. At all. Ever. But I hope I don't sound dogmatic at all here…

So what should John do? My advice would be to store the album or CD data in one table and the track information in another, with a one-to-many join between each CD and its constituent tracks. The two tables, CDs and Tracks, and the relationship between them are in the sample MDB. A simple form (auto generated) displays the tracks as required (see screen 4); or you can use a report.

It's a little more effort but in the long term this structure should make any future querying a great deal easier – and you'll also enjoy the warm glow from knowing your database adheres to relational database theory.

On the other hand I always try to answer the question as well as proffering gratuitous advice and John may already be aware of these arguments and have good reason to use a single field. The answer is to use a Text or a Memo field. You can force a new line for each track with Ctrl and Return. Once you've typed a title and pressed Ctrl and Return, the title vanishes because the cell is only one line deep. Make it wider by placing the mouse over the line indicating the bottom of the row in the left hand grey border to the table and dragging downwards. Your table could look like screen 5. **PCW**

Putting carriage returns into a memo or text field gives a vertically-listed display

Tim Anderson is an IT journalist and software developer, and began writing for PCW in 1993. Since his first Commodore Pet, he has acquired expertise in Rad programming, Windows and the internet.

→ Comments welcome on the Visual programming column.
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Please do not send unsolicited file attachments.

Further down the code

We find out how to work backwards, and migrate code you no longer have

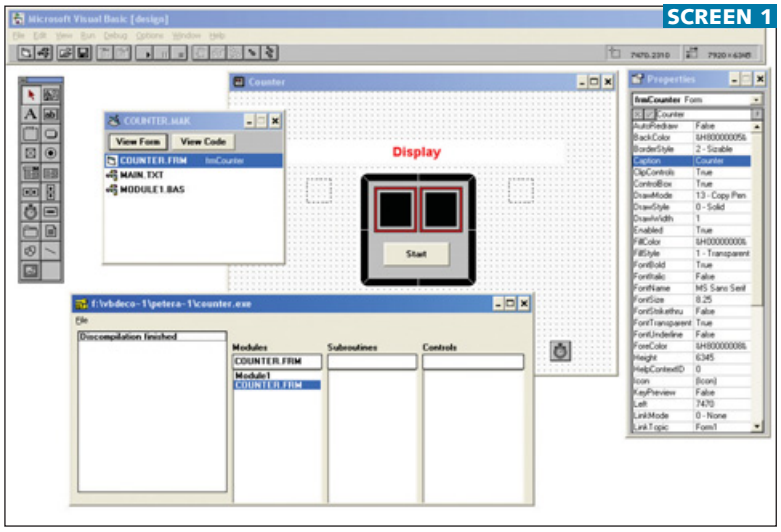
What do you do when you need to modify your application but cannot find the code? Peter Altman contacted me about a Visual Basic 3.0 puzzle which he wanted to run on his Windows Mobile PDA. All he had was the compiled code, written for him by a friend who had died. VB 3.0 is 16-bit software that is fifteen years old. The best chance, short of a full rewrite, was to port the application to Visual Basic .Net, which runs on Windows Mobile under the Compact Framework runtime, but for that the source was required.

This kind of scenario can be a critical problem when it happens with a business application. It should never happen, but small businesses can be disorganised, and developers can be protective of their code. 16-bit code is an interesting case. The move to 64-bit Windows is in its early stages, but will gather pace over the next few years, and 16-bit applications do not run on 64-bit Windows. Virtual PC or the like is one answer, since it lets you run a different operating system within Windows, but even that does not help you if you need to modify the code or port it to another platform.

Decompilation

If you have an executable for which the source is not available, then you can resort to a technique called decompilation. The aim is to start with the binary file and work backwards to the original code. Decompilation has many challenges. It may be illegal; many licence agreements forbid it. Some code is deliberately obfuscated to make decompilation more difficult.

Another factor is what type of compiled executable you are dealing with. Native code binaries such as those produced by C, C++ or Delphi are more difficult to decompile than the intermediate code in Java, .Net or early versions of Visual Basic. A lot of Java and .Net code is trivial to decompile with a suitable utility, unless the programmers have taken deliberate steps or used a tool to obscure it. Here's how we decompiled Peter Altman's code.



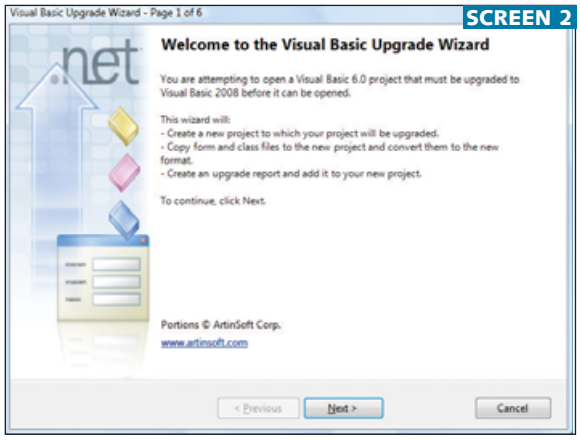
Blast from the past: a Visual Basic 3.0 application decompiled and opened in the IDE

Visual Basic 3.0 uses an intermediate language. Many years ago a programmer called Hans-Peter Diettrich, also known as 'Dodi' created a decompiler, which is still probably the best tool for this. You need to have VB 3.0 installed. Microsoft can no longer supply it, but fortunately I still have a copy. Windows XP or earlier is recommended, as Vista's User Account Control introduces complications. Diettrich told me that he uses Windows 98 in a Virtual PC.

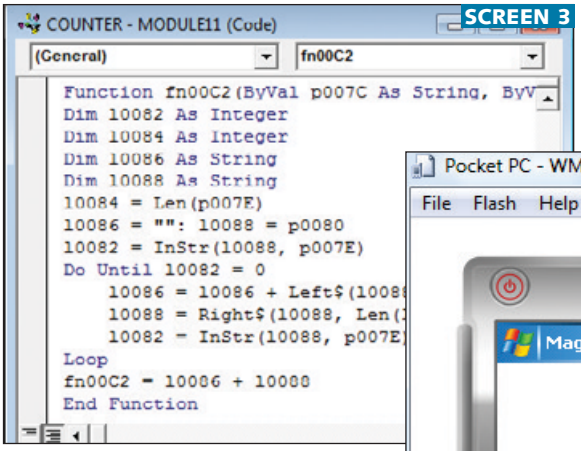
I found it necessary to check the vb.ini file in the Windows directory, which should have a vbpath entry, in the Visual Basic section, pointing to where VB 3.0 is installed.

Once everything is set up, run vbdis3.exe, which is the decompiler. Choose File – Open and select the compiled VB 3.0 executable, which in this case is called counter.exe. Next, you are prompted for a location for the decompiled project. Click OK, and all being well the decompiler invokes VB 3.0 to complete the process. It's not perfect and may trip up over some VBX controls. You will also find that variables and function names have auto-generated values. It is a good idea to try renaming these to something meaningful, if you can figure it out. Nevertheless, it is a huge head start (see screen 1).

Diettrich kindly provided a working demo version of his decompiler for *PCW* readers. A professional version is also available,



Importing a project into Visual Basic .Net using the conversion wizard



A sample of decompiled code with mangled variable names

with extra features for handling tricky problems like third-party VBX controls.

Porting to .Net

This is only the beginning of the porting process. How do you port a VB 3.0 application to VB .Net? One idea is to try Microsoft's automatic project conversion. The first snag is that VB is fussy about what it will import.

Visual Basic .Net will not look at a VB 3.0 project, but fortunately VB 6.0 is more tolerant. Peter Altman's simple application imported smoothly into VB 6.0, needing only the adjustment of a couple of API calls to 32-bit. It even ran correctly.

The next step was to go from VB 6.0 to VB .Net. This is inherently difficult, because it is really a different platform, but Microsoft has put huge effort into it because it is a common scenario. I used Visual Studio 2008, and chose Convert from the Open menu (see screen 2). The import seemed to go well, but the application did not run correctly. The problem is that VB 6.0 and earlier has all sorts of quirks which cause problems when you try and port the code. In this case, the original programmer used VB's Scaletop and Scaleleft properties to set up a custom coordinate system, and the converter had no idea how to cope with this. Another issue was that a VB 6.0 control array got converted to a compatibility object called a PictureBoxArray. Objects such as this live in the Microsoft.VisualBasic.Compatibility.VB6 namespace and, although it helps to get code running quickly, it won't work in the Compact Framework. I converted the code to use a standard ImageList control.

At this point the mangled variable names were a nuisance. Here is a sample of decompiled code (also shown in screen 3):

The ported Visual Basic 3.0 application running on the Windows Mobile emulator

```
Function fn00C2(ByVal p007C As↙
String, ByVal p007E As String,↙
p0080 As String) As String
Dim l0082 As Integer
Dim l0084 As Integer
Dim l0086 As String
Dim l0088 As String
l0084 = Len(p007E)
l0086 = "": l0088 = p0080
l0082 = InStr(l0088, p007E)
```

Fixing the problem with Scaletop and Scaleleft meant going through the code, figuring out what the variables meant and renaming them accordingly. Would it be quicker to rewrite from scratch? In many cases it would. Even so, the decompiled code could be useful as a guide to how the original application worked.

Converting an entire project from VB 6.0 is often not the best approach, because it results in a sub-optimal application that needs a lot of manual tweaking. Another idea is to create a new .Net project, but paste code from the old VB 6.0 project.

Visual Studio has a handy tool called Upgrade Visual Basic 6.0 code, which gets you started with porting a block of code.

From desktop to mobile

The final stage was to port the desktop VB.Net project to the Compact Framework. Create a new Smart Device project, making sure that you target the right kind of device. Next, copy any non-visual code to the new project. Forms are more challenging, but you can sometimes save time by copying controls from the old project to the new, using the clipboard. Inevitably, the user interface will need to be redesigned for a small screen. The Smartphone format does not have a mouse or a stylus, and there is no such thing as a button control. Anything involving database access will need rethinking, though fortunately Peter Altman's simple puzzle had none. In this case the main challenge was doing without a mouse.

Developing for the Compact Framework with Visual Studio 2008 is a joy. The latest emulators work smoothly (see screen 4). One thing to note is that closing an application on Windows Mobile does not remove it from memory. If you are debugging, this means that Visual Studio continues in debug mode. The solution is to open the Memory applet on the emulator and terminate the application instance.

Deploying to Windows Mobile

First, your users will need to install the Compact Framework runtime. The latest version is 3.5, though version 2.0 is smaller and may be all that you need. This can be downloaded as a Windows Installer setup. Run the setup with the device connected, and it will be installed automatically.

To create a CAB file for your application, add a Smart Device CAB Project to your Compact Framework solution, and add the primary output from the application to the CAB project. Right-click the primary output in the Application Folder and choose Create Shortcut to add a shortcut for the device. Now build the CAB. Users can install by copying both the CAB and the generated .inf file to their device and running it. **PCW**

Resources

A demo version of the VB3.0 decompiler can be downloaded from **www.itwriting.com/pcw**.

Deploying .Net Compact Framework applications with .cab and .msi files:
http://msdn2.microsoft.com/en-us/library/aa446504.aspx

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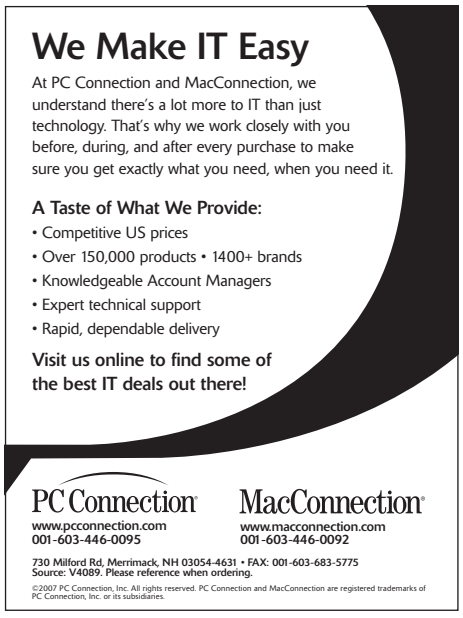

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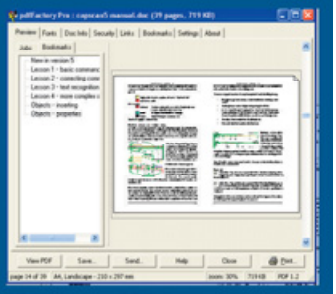

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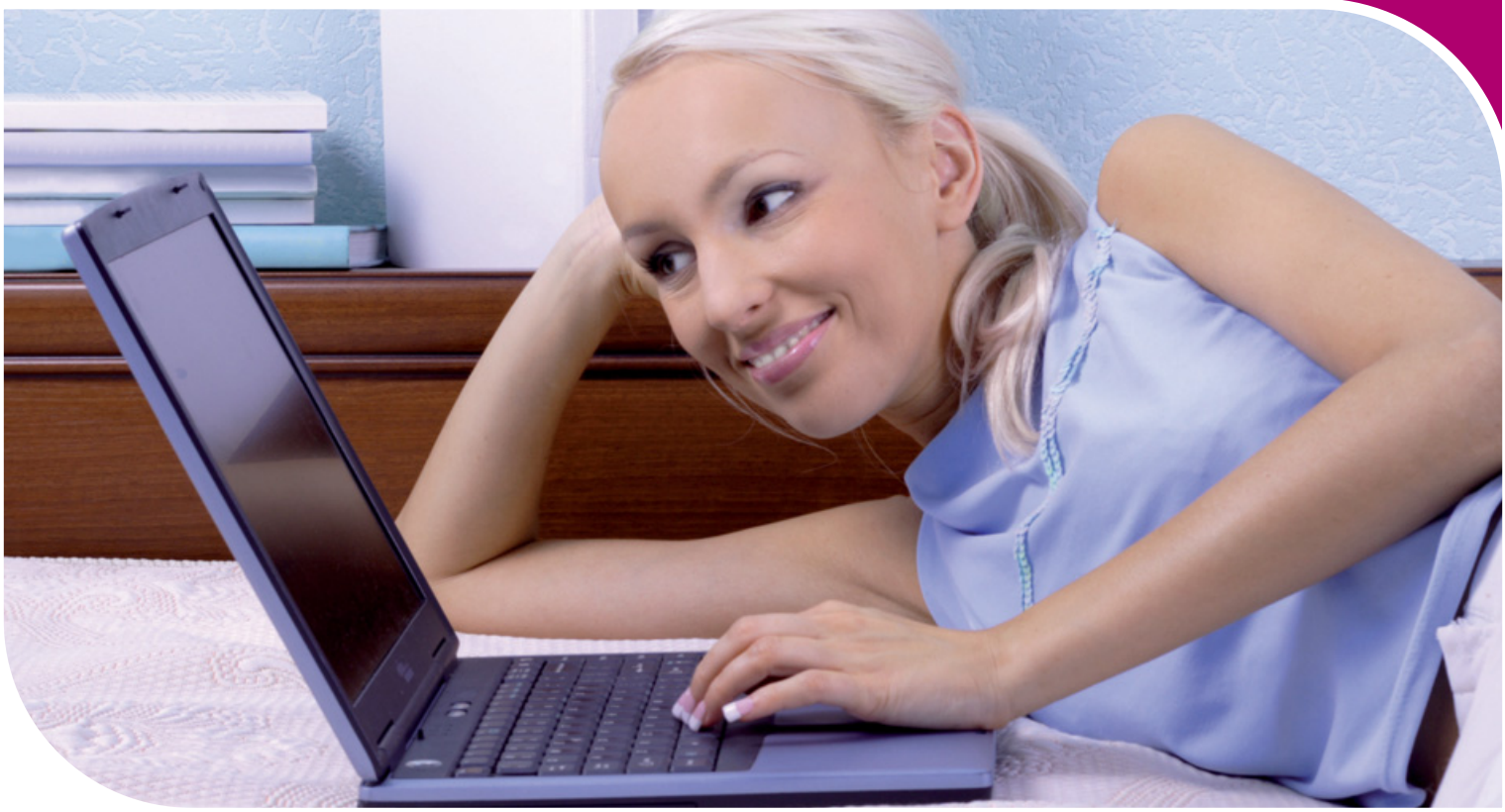

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Nero 7 Essentials

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INFORMATION

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Contact www.nero.com

Registration Nero 7 Essentials comes with a built-in serial key

Need to know Nero 7 Essentials doesn't include MPEG2, AC3 or MP3 encoders

Some mastering tools make even the most basic disc-burning tasks seem complicated, forcing you to navigate through a confusing set of complicated options before you can finally achieve your goal. Fortunately there's now an answer in Nero 7 Essentials, which delivers a range of core CD and burning functions with the absolute minimum of hassle.

To burn an audio CD, for instance, click Audio > Make Audio CD within Nero Smartstart, the central launching point for all Nero tools. Drag and drop your audio files onto the resulting screen, check a box to normalise the volume if necessary, and click Next > Burn. Easy.

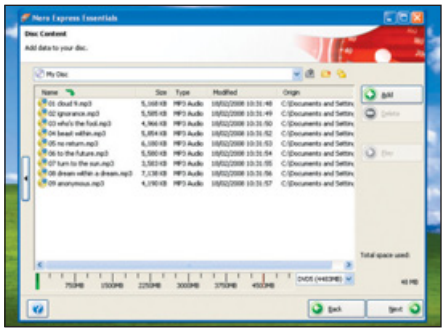
It's just as straightforward to build MP3 CDs, audio DVDs, data CDs or DVDs, in fact the screens involved are almost identical; figure out one (something which will take you no time at all) and you'll know how to use them all.

Nero hasn't discarded every configuration option, of course, it's just moved the more advanced functionality out of the way. And so if you know what you're doing, then within three mouse clicks you can be configuring your maximum CD and DVD overburning size, generating short lead-outs to help you cram more data onto a disc, and a whole lot more.

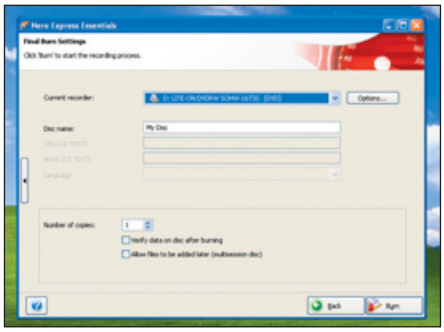
And of course there are plenty of other tools to explore. The suite can also help you build Photo Slide Show CDs, for instance; create Video and Super Video CDs (not Video DVDs); burn disc image files; copy discs; design CD/DVD labels and covers; stream video, music and photos over a local network, and more.

Enjoy quick, hassle-free CD and DVD burning

1 Nero 7 Essentials starts with its central Startsmart launcher, offering shortcuts to all its major functions. Just hover the mouse cursor over a category (Audio, for example), then choose a task to perform like Create Audio DVD. Some categories have a few hidden, more advanced tasks: click the toggle icon (third from the right at the bottom of the screen) to see them.



2 Choose an option that involves burning any sort of data to a disc and you'll probably end up here, at the Disc Content page. Click Add or just drag and drop whichever files you need onto the work area, as required. The indicator bar at the bottom of the screen will show you how much disc space you've consumed, and what's left. Right-click individual files to see further options.



3 Insert a blank CD or DVD, then click Next. By default you'll see only a few very basic options, like the ability to name your disc, or specify the number of copies. Click the button centre-left of the window, though, and an extra panel opens where you can specify additional details like the writing speed. When you're happy, click Burn and watch as your disc is created.

UPGRADE OFFER

MPEG2, AC3, MP3 encoders
Blu-ray authoring and playback
Fast video conversion
Electronic Programme Guide
Disc Copy Vista Gadget
Password-protect CDs and DVDs

SAVE £10 ON NERO 8

Upgrade to Nero 8 and you'll gain the MPEG2, AC3 and MP3 encoders that Nero 7 Essentials doesn't include. But that's just the start. You also get Blu-ray authoring and playback, with quality 3D menus up to 1080i. The Electronic Programme Guide support lets you record all your favourite TV shows on your PC; there's the ability to create password-protected CDs or DVDs to protect valuable files, and a handy Windows Vista Disc Copy gadget for one-click copying. The downloadable version of Nero 8 usually costs £49.99, but you can upgrade for only £39.99, a 20 per cent discount. Click Start > All Programs > Nero 7 Essentials > Nero Online Upgrade to read the details.

Ashampoo Multimedia Pack 1

Manage photos and audio files, burn DVDs and more

Managing a large collection of digital photos, music and video files is not always straightforward. Photos go missing, it's difficult to process or share them, music files don't always work with your MP3 player: there are all kinds of potential problems. But if your current applications can't cope, you could always try installing the Ashampoo Multimedia Pack 1, a one-stop solution for just about all your multimedia needs.

At the heart of the suite is Ashampoo Photo Commander 5. This lets you browse your digital photos and use them to create calendars, collages, web albums and more. You're able to build slideshows with custom music and stylish transition effects. And the program can also manage video and audio files.

The Multimedia Pack also includes Ashampoo Magical Snap, a powerful screengrab tool. It helps you grab complete screens, individual windows or user-defined areas, take multiple snapshots in one session, edit your images, annotate them and more.

Ashampoo Music Studio 2007 caters for your audio needs, converting common file formats, normalising a group of files to ensure they have the same volume, editing tags, even trying to repair broken audio files.

The collection is completed by Ashampoo Burning Studio 6. It's one of the easiest ways to create data discs, burn or rip music and movies, or back up your multimedia files, and CD, DVD and Blu-ray media are supported.

INFORMATION

System requirements Windows 2000/XP/Vista, 68MB disk space

Contact www.ashampoo.com

Registration Follow instructions during installation

Need to know Ashampoo Music Studio 2007 can read, but not modify MP3 files, so functions like normalisation require other formats

Three reasons why you need the Ashampoo Multimedia Pack 1

1 Ashampoo Photo Commander can transform ordinary digital photos into something special with the minimum of effort. Open your image, then click Edit > Show/Hide Frame Style Center. Choose the Shapes option and you can display your photo in a circle, heart or jigsaw piece, among other shapes, or just choose a smoky border style like this one.

2 Ashampoo Music Studio 2007 has an in-depth audio file format conversion tool if you need to create WMA, OGG, FLAC or WAV files. You get control over the sample rate, encoding type (VBR or CBR, quality and bit rate settings), and can even normalise the files at the same time to ensure they all play at around the same volume level.

3 Ashampoo Magical Snap is a tool that allows you to take screengrabs with one keystroke or mouse click. It's extremely configurable, so you can choose to include the mouse cursor, with an optional shadow in your choice of direction, save the image to a predefined shape, resize it, add a fade effect, choose a background colour and more.

UPGRADE OFFER

Create video DVDs
Full MP3 support
Build bootable discs
One-click photo fixes
Export to PDF

ASHAMPOO MULTIMEDIA PACK 2

Move to the latest version of the Ashampoo Multimedia Pack, which costs $49.99 (about £25) and you'll gain full support for MP3 files, including file conversions, editing tags, creating MP3 CDs and more. Burning Studio 7 can create video DVDs from your WMV, AVI and MPEG files with the minimum of effort. Photo Commander 6 now has one-click tools to correct colour, contrast, red-eye and other common photo problems, while the new Ashampoo Movie Shrink and Burn 3 quickly resizes and converts your digital videos with very high-quality results.

Antivir Personal Edition Premium

Keep viruses, worms and other malware locked out of your PC

INFORMATION

System requirements Windows 2000/XP/Vista, 40MB hard disk space
Contact www.avira.com
Registration Get your licence from www.avira.com/vnu
Need to know This build will expire six months after installation

Avira Antivir Personal Edition Premium not only offers protection against viruses, worms, Trojans and rootkits, but also spyware, adware and phishing. Emails received via POP3 clients may be scanned to block incoming threats. And signature updates are sent through the Premium server, which ensures better download performance.

The program can also detect other programs that fall into what it calls 'extended threat categories'. These could include games, if this is an office system for instance, hacking tools or joke programs. It can also look for executables that have been processed by unusual runtime compression tools. These compress an executable file to reduce its size, and so might have been applied innocently, but they're also often used to make it more difficult for anti-virus tools to detect a known malware signature.

There's additional protection in the form of heuristic file analysis, which looks for signs that may indicate you've downloaded something nasty. This kind of technique can deliver false alarms, but the extra protection it offers against new malware means it's still worth using.

Perhaps the best part of Avira Antivir Personal Edition Premium, though, comes in its configurability. You're able to create a profile that defines exactly which drives and folders you want to scan, then tweak almost every aspect of the scan itself to ensure it's doing what you need (see the workshop below), adding a neat finishing touch to what is already a fast and extremely accurate anti-virus engine.

Easily configure Avira Antivir Personal Edition Premium

1 You could install Avira Antivir Personal Edition Premium and forget it, running the program on its default settings, but you'll probably get better results by tweaking it to suit your needs. Click Extras > Configuration, then check Expert Mode to see all the available settings. Go to Scanner > Scan, say, to enable searching for rootkits before a scan, a slower but more secure setting.

2 Avira Antivir Personal Edition Premium will detect most malware through discovering matches in its signature database, but the program can also use heuristic algorithms to try to pick out files that look suspicious. Click Scanner > Scan > Heuristic and try the High detection level to detect more dangers, or turn it down if you're currently getting too many false alarms.

3 Click General > Extended threat categories. Avira Antivir Personal Edition Premium can detect more potential dangers than are enabled by default, so browse the list and select whatever you'd like it to check. Now click General > Security. Normally the program alerts you if there's been no virus update for three days, but that could be too long: set it to two days, instead.

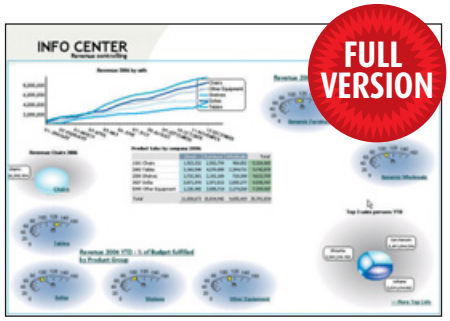
UPGRADE OFFER

AVIRA®

EXTEND YOUR LICENCE FOR JUST £15

Install Avira Antivir Personal Edition Premium and it'll immediately go to work, keeping your PC free of malware for six months. However, if you'd like to use the program after that, you'll need to buy a new licence. Prices start at a very reasonable £15, which gets you a one-year licence that can be used on up to three different PCs. But if you're after real value for money, then we'd opt for the three-year deal, which again covers up to three PCs and costs only around £35. Visit **www.avira.com** to order, or take a look at the company's many other security products.

Dynamic AI 6 Personal Edition



INFORMATION

System requirements Windows 2000/XP/Vista, 20MB disk space

Contact www.dynamic-ai.co.uk

Registration Launch the program and follow the activation instructions provided

Need to know Limited to one concurrent user; licensed for private, non-commercial use only

Powerful charting features are on tap to help you interpret your data

Most medium-to-large businesses store large amounts of data across a variety of IT systems: some application databases over here, a central data warehouse over there, a CRM and more. That's fine for individuals in those departments, but if you're trying to get an overview of your business, something else is required.

Dynamic AI is a browser-based tool that provides speedy access to information in all the database formats that matter: Microsoft SQL Server, Oracle, IBM DB2 (ODBC/OLEDB), MySQL, Microsoft Access (ODBC/OLEDB) and Excel, Pervasive PSQL, Sybase and Informix, with a generic ODBC connector just in case you ever need to plug into anything else.

Launch the program, connect to your chosen source, and within moments you'll be generating basic reports with filters, sorting, totals and more. Explore a little further and you'll soon be adding drill down possibilities or calculations, entering or creating new relationships between data, producing charts or combining multiple reports into one.

You can always export data to Excel, or work on it in additional formats such as CSV or XML. Of course, there's absolutely no coding required. And because Dynamic AI runs on a web server it works just about everywhere, running happily on Internet Explorer (versions 5, 6, 7), Firefox 2, Safari 3, Opera 9 and Netscape 8.

UPGRADE OFFER
GET DYNAMIC AI FOR BUSINESSES

The Personal Edition of Dynamic AI is only licensed for non-commercial use. If you'd like to use it within your company, you'll need to upgrade.

Moving to Dynamic AI Desktop is the simplest option, and will give you a commercial single-user licence for £660 plus Vat. Or you could try Dynamic AI Server, which allows multiple users and adds extra features such as a design dictionary, logging, automation, support for browsers on mobile devices and more. This costs £5,500 plus Vat for a five-user version, with discounts available for additional users. Visit **www.dynamic-ai.co.uk** for more.

Ashampoo Antivirus 1.5

FULL VERSION

INFORMATION

System requirements Windows 2000/XP/Vista, 12MB disk space

Contact www.ashampoo.com

Registration Launch the main program after installation and select Get Full Version

Need to know This build of Ashampoo Antivirus will expire three months after installation

It's easy to set up automatic virus scans of individual folders to your entire system

It's been a few years since we've had a headline-grabbing virus story but don't be fooled, it isn't good news. The people behind malware have realised that it's better not to gain attention, and so have developed Trojans and bots that are far more stealthy and difficult to spot.

Ashampoo Antivirus 1.5 monitors files you access or download and compares them to the signatures of over 470,000 viruses, worms, Trojans and diallers. The database is updated many times a day, and checks for new signatures can be made every hour.

It still takes time to discover new threats and develop an appropriate signature, of course, so Ashampoo Antivirus also provides its own brand of heuristic analysis. This looks to identify and block programs based on suspicious behaviour alone, and so could protect you from totally unknown dangers.

A good range of scanning options means you're not forced to run full system scans all the time. In a couple of clicks you can choose simply to scan the files in memory, system areas on your hard drive, or all CDs and DVDs, for instance, a handy time-saver.

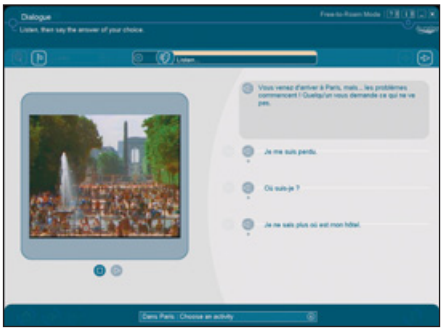
You're also able to schedule up to eight of these operations to run at the time of your choice, and integrate a Scan option in the Explorer right-click menu for handy on-demand checking. There are plenty of other useful configuration options, too, so be sure to check the Preferences dialogue.

UPGRADE OFFER
EXTEND YOUR ANTIVIRUS LICENCE

Install our build of Ashampoo Antivirus and it'll keep your PC safe for three months, but if you want to continue using the program after that, you'll need to buy a new licence. You can extend it to a year for only £8, though (click Internet > Buy licence extension). The current cost of a full year's licence after that is £19.99, with discounts of up to 50 per cent available if you're buying 10 or more licences. Check the Ashampoo site to find out more.

Tell Me More

ON OUR COVER DVD



INFORMATION

System requirements Windows 2000/XP, 50MB disk space
Contact http://en.tellmemore.com
Registration Not required
Need to know This version contains the first hour of learning. It's licensed for personal, non-commercial use only

Video and audio clips help bring your chosen language to life

With the winter finally over and decent weather back again, it's time to start thinking about your summer holiday. And, maybe, how you'll communicate with the locals when you reach your destination.

Tell Me More is a Flash-based language learning tool, and this version includes lessons in both French and Spanish. There are no tedious vocabulary lists to learn, instead the program throws you into a number of common situations (walking around town, at the hotel and so on), playing a question in your language of choice and letting you choose the appropriate answer. Translations are a click away if you need them.

Get tired of this exercise and there are plenty of others to try. You can concentrate on your vocabulary, for instance, with activities that start very simply (click on the word that matches a picture) and can become quite advanced (could you complete a French crossword puzzle?) The Cultural Workshop includes things like Role Play supposedly on a film set, where you can get to dub a character's lines. You can focus on grammar, and even work on pronunciation, repeating troublesome words into a microphone with a wave form displayed to ensure you're getting it right: there really is something here for everyone.

READER OFFER
LEARN MORE LANGUAGES

Visit the Auralog website and you'll find many more languages available. There's much more content: for example, the Italian package delivers 850 hours of learning, over 4,500 exercises and 37 types of activities. And advanced speech recognition technology analyses your pronunciation and pinpoints any errors. Buying the software on a DVD can cost between £120 and £250 but you can also subscribe to an online service, maybe taking a month-long course for only £40. It's your call, and you can find out more at **www.auralog.com**.

Pinnacle Videospin

ON OUR COVER DVD

INFORMATION

System requirements 2.4GHz CPU (1.6 GHz dual core), 1GB RAM, Windows XP SP2/Vista, 150MB disk space, 64MB DirectX 9 graphics card
Contact www.videospin.com
Registration Complete the form during installation
Need to know The bundled Advanced Codec pack is a trial version that will expire after 15 days

Add stylish transitions, credits, photos and a soundtrack to your video with just a few clicks

The key to producing a quality movie clip is always in the final edit, and just a few minutes spent with Videospin can make a huge difference to the end result.

The program starts by displaying the contents of your My Videos folder. If your footage isn't there, go to its folder and select the video file. Click the 'Show all scenes...' icon and Videospin will detect all the individual scenes that file contains. Now you can drag and drop the particular scenes you want onto the timeline, leaving out any others. Press Play to view the results, then resize clips, drag and drop to rearrange them, or import clips from other movies until you're happy.

You can choose to add transitions in a similar way. Click the transition button, pick a fade, dissolve, wipe or slide, then drag and drop it between two images on the timeline. Resize the transition to prolong the effect, and preview.

You might also decide to mix in your own photos, and you can add audio through your own music files, or the bundled sound effects (animal noises, crowd sounds, vehicles, there's plenty on offer if you need atmosphere or comic effects).

And when you've finished, the program can render your video in AVI or other formats, or better still upload it directly to Youtube or Yahoo Video.

UPGRADE OFFER
UPGRADE TO PINNACLE STUDIO

Pinnacle Videospin is a free tool and doesn't have an upgrade path, but if you'd like to extend the program there are two paths you can take.

The first option is to purchase a copy of the Videospin Advanced Codec Pack when its 15-day trial period ends. The Pack costs £9.99, and you can order it by clicking Help > Purchase Activation Keys.

If you need a more powerful editor, though, look no further than Pinnacle Studio. It's simple to use yet packed with sophisticated features, and can be yours for £39.99. Find out more at **www.pinnaclesys.com**.

COMPETITION

WIN! Win one of five Terratec Noxon 2 for iPod

This month we've teamed up with Terratec to give away five Noxon 2 docking stations for iPods worth £250 each. The Noxon 2 is more than just an iPod docking station. It's also a wireless internet radio, an intuitive podcast receiver, a multiformat network player for music from all your hard drives and a regular FM radio.

Thanks to the integrated 2.1 speaker system, your music always has the best bass and clearest treble levels, and its slick appearance raises the bar higher than ever in the music player field.

Many music fans have their collections distributed across a variety of media and technologies, resulting in snarled cables, stacks of burned CDs and general file format chaos. The Noxon 2 simplifies your setup. For starters the integrated iPod Universal Dock turns your iPod into a stereo system and charges it at the same time.

You can also select and play any one of more than 10,000 Internet radio stations from around the world without needing to boot your computer. Its refined sorting system can memorise your favourites at the touch of a button and can be customized in detail so you stay on top of such a vast selection.

A wide range of podcasts is also available at the touch of a button, giving you the information you need straight from the source, without technical hassles.

Thanks to the powerful networking features of the Noxon 2 for iPod, you can at last enjoy music from your PC or network attached storage anywhere in the house. Regardless of whether you are using a wired or wireless Lan, or even a Homeplug network, your digital music will finally be on tap in your bedroom, living room, kitchen or bathroom, while your computer stays where it belongs – in your home office.

If you're planning a really big party, simply connect active speakers or a full-size hi-fi system to the line-out or digital-out ports. A headphone socket is also provided for quiet enjoyment. For more information go to www.terratec.co.uk

The Noxon 2 is more than just an iPod docking station

For your chance to win one of these great prizes, answer the question below and enter online at **www.pcw.co.uk/competitions**. The competition opens on 20 March 2008 and closes on 16 April 2008.

How many internet radio stations from around the world can you listen to on the Noxon 2 for iPod?

a) 2,000
b) 6,000
c) More than 10,000

This competition is open to readers of *PCW*, except for employees (and their families) of Incisive Media, and Terratec. PCW is the sole judge of the competition and the Editor's choice is final. Offer applies to residents of the UK and the Irish Republic only. Entrants must be over the age of 18 and only one entry per household will be accepted. Winners will be selected at random from all correct entries received. No cash alternative is available in lieu of prizes. Incisive Media will use all reasonable endeavours to notify the winner(s) within 14 days of the close of the competition. Incisive Media reserves the right to substitute the prize for one of greater or equal value if circumstances make this unavoidable. Prizes will be dispatched by the competition sponsor(s) and the winner(s) name(s) and address(es) will be provided to the competition sponsor(s) for this purpose. No purchase of the magazine is necessary to enter the competition. Incisive Media will use all reasonable efforts to ensure that the prizes are as described on this page. However, Incisive Media cannot accept any liability in respect of any prize, and any queries regarding a prize should be taken up directly with the sponsor of that prize.

The winner of the February competition is Astrid Stephen, who wins an Alienware Aurora 7500 gaming PC, plus a copy of Flight Simulator X: Acceleration expansion pack, as well as the original Flight Simulator X. The five runners-up are Alex Newman, Michelle Clark, Frank Duffy, Michael Lannon, Tommy Hewitt who each win a copy of Flight Simulator X and the Acceleration expansion pack.

ENTER ONLINE AT www.pcw.co.uk/competitions

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www.pcw.co.uk

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The Test Bed

Our labs blog, the Test Bed, gives you regular updates on the latest gossip, technology trends and products.

→ **http://labs.pcw.co.uk** → **http://www.reportlabs.com/testbed**

PCW Forums

Get involved with the *PCW* community of readers, get help with your PC problems, or just join in the lively debates.

→ **http://www.pcw.co.uk/forums**

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You may recognise some entries in this blog from our Letters pages, but they are published here first, letting you add your views and comments.

→ **http://interactive.pcw.co.uk**

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If you want to keep up with the latest news, reviews, blogs, Hands On and software downloads, then sign up for our weekly *PCW* email newsletter. It is published every Friday and gives you a selection of the highlights from the week. Our Products newsletter goes out on Wednesdays and includes the most important news stories and reviews.

→ **https://www.vnuservices.co.uk/pcw**

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To help you get up-to-the-minute news and reviews automatically, we offer several RSS feeds for you to use in your favourite RSS reader.

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Prices: All prices include Vat unless otherwise stated.

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10 tips for buying safely

1. Get written quotes from shops specifying components used, or print off and keep spec sheets from websites.
2. Use a credit card if possible for purchases of £100 or more; you could get compensation from the card company if a supplier goes out of business.
3. Keep good records, storing receipts, correspondence in one place.
4. In England and Wales, the onus is on retailers to prove that faults found within six months on purchases are not inherent.
5. Goods ordered online, by phone or post can be returned under the Distance Selling Regulations without explanation within a reasonable time – this is widely accepted as being seven days.
6. Open and inspect all goods as soon as possible after delivery and make sure they work.
7. Companies are not obliged to repair or replace goods damaged by accident or misuse, unless it is caused in transit by a delivery service.
8. Companies cannot charge for a service that isn't being delivered, but never stop a direct debit while under contract.
9. Consumers should not suffer financial loss for repairs that are not their fault, so claim back carriage charges.
10. If a dispute arises, take advice from Consumer Direct at www.consumerdirect.gov.uk.

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Personal Computer World

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Explore the great outdoors

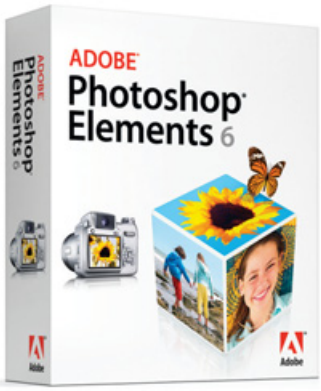
Sat nav is best known for in-car use, but there's a growing market for GPS devices that help you navigate the great outdoors on foot. An outdoor GPS will help keep you on track during country walks and long-distance hikes, pointing out areas of interest along the way. We head for the hills and give the latest models a thorough road test.

Tame Vista

Microsoft's latest operating system has its fair share of quirks, but with our guide you needn't let them spoil your enjoyment. We examine the most common problems and show you how to get to grips with Vista.

Image editing suites

You don't need to spend a fortune to enhance your collection of digital images, nor do you need specialist skills. We take a look at six of the latest image editing suites, all of which are priced well under £100.



ATX motherboards

A motherboard is one of the most important components of any PC. If you're looking to upgrade, or perhaps even build your own system, be sure to check out our group test of the latest motherboards. With low price tags and bags of features, there's something for everyone.

There's lots more in June's PCW
DON'T MISS IT...

MAY 2003

From the archives: Take a look at the important events in technology five, 15 and 25 years ago.

Intel's 802.11b Wifi was an integral part of its new multimillion pound Centrino brand, which also required laptops to use a Pentium M processor and an 855-series chipset. The company said its new platform would eventually lead to eight-hour battery lives, although we've yet to see that reliably achieved.

Intel's big Wifi push coincided with PCW taking an in-depth look at Wifi routers. We had 802.11b models to hand, which showed a 20 per cent decrease in performance when Wep encryption was applied. We also noted that Wep was less secure and it was soon to be replaced by an interim solution called WPA.

In our "After they were famous" feature, we indulged in the fall from grace of some of IT's biggest stars. We started with Steve Wozniak, co-founder of Apple, who first bowed out from Apple after crashing an aeroplane he wasn't qualified to fly. After six months in hospital, his role at Apple had changed and he left in 1987.

We also investigated Brent Hoberman, who floated Lastminute.com at the height of the dotcom boom. In March 2000 shares sold for £3.80, valuing Hoberman at £77m. Plenty of small investors lost money as the firm's share price dropped to 19p, but Hoberman continued, survived and stayed CEO until 2006.

MAY 1983

A letter criticising our review of the IBM PC elicited a sharp response from editor Peter Rodwell: "There are several 16-bit machines around with higher disk capacity, high-resolution graphics and nice keyboards selling at lower prices than the PC." Perhaps that was true, but few would believe the UK's leading PC magazine, which would owe so much of its future to that very machine, could have been so critical.

Not caring for a different kind of PC, a 1983 advert urged you to "justify your monitor with your wife" by purchasing a combined TV-cum-monitor.

Meanwhile, Guy Kewney was kitting out his kitchen. "I liked the idea of a washing machine with a computer in it," he wrote. "So I bought a Philips machine with electronic written on the front. It broke down, and when the engineer opened it, I noticed the cogs and wheels". Kewney was left wondering about the electronics. The motor ran at different speeds: slow for wash, fast for spin – this is because there was a thyristor in the system, and a thyristor is electronic.

MAY 1993

We reviewed the Logitech Mouseman Cordless mouse, which impressed us as it used radio rather than infrared. It was about the same size as a regular mouse where the first wireless incarnation had been huge. The £99 price was quite reasonable too.

Radius also released its Videovision video capture card for the Mac that could display movies at a resolution of 160x120 pixels. As it only cost £1,995 we classed it as a budget device.

The story of the rise and fall of Acorn also made for an interesting business case study. It went from boom to bust between 1979 and 1984, ending up being 'rescued by Olivetti' – another British company going abroad.

Our cover story was Intel's Pentium processor. The new 66MHz chip was causing shockwaves as it had nearly twice the performance of a 486DX2-66 but cost three times as much. In addition its huge 3.1 million transistor count meant it required 13W of power, and software had to be rewritten to get the most out of it.

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